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Report of the
Ontario Council
of Health on

Annex "H"

Health Care Delivery Systems




Ontario Department of Health
Honourable Thomas L. Wells, Minister

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HEALTH CARE DELIVERY SYSTEMS



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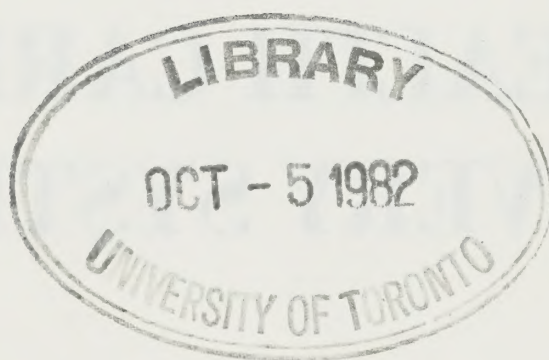
**REPORT OF
THE ONTARIO
COUNCIL OF HEALTH**

on

**HEALTH CARE
DELIVERY SYSTEMS**

ANNEX "H"
OCTOBER 1969

ONTARIO DEPARTMENT OF HEALTH
Honourable Thomas L. Wells, Minister



Produced for the
ONTARIO COUNCIL OF HEALTH
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FOREWORD

The Committee on Health Care Delivery Systems concerns itself with a broad assessment of the total spectrum for delivering health care through health care systems. To that end it has established six Sub-committees. These Sub-committees, each of which concerns itself with a specific facet of health care delivery, are (1) Highly Specialized Services, (2) Community Health Care, (3) Dental Care Services, (4) The Role of Computers in the Health Field, (5) Rehabilitation Services, and (6) Laboratory Systems.

A final report was received by the Ontario Council of Health from the Sub-committee on Highly Specialized Services, in October 1969. This report deals with the development of highly specialized services within the overall health care framework. It makes recommendations on the highly specialized and associated services which should be provided at the various levels of care—Provincial, Regional (or University Health Sciences Centre), and District or Community. Forming the basis of these recommendations is the recognition of the need to concentrate and conserve resources, including skilled manpower, and to provide and maintain skills at the highest level. Also recognized is the importance of the elements of education and research.

The Sub-committee on Laboratory Systems submitted a report to Council in October 1968. The report established the desirability of regionalizing laboratory services within the context of regional organization of all health services. This, it is indicated, would increase efficiency of existing laboratory services and provide an orderly framework for expansion so that patient and clinician would both receive maximum benefit from available resources. Also included in the report are basic principles concerning the characteristics and organizational structure of such a system. The Sub-committee is now involved in the second stage of its activities. It is developing recommendations of principle on the nature of the system and the method by which such a system might be brought into operation.

Readers are reminded that, while the Ontario Council of Health

has endorsed the report as printed, it did so without formally attempting to co-ordinate the views and recommendations presented with those presented by other Committees of Council. In view of this, it is possible that Council could adopt a modified position when the influences of recommendations by other Committees and Sub-committees are assessed.

The activities of the Committee on Health Care Delivery Systems are on an ongoing basis. Reports of Sub-committees, as and when these are completed, will be submitted to subsequent meetings of the Ontario Council of Health.

MEMBERS OF COMMITTEE ON HEALTH CARE DELIVERY SYSTEMS

Dr. K. C. Charron, Chairman	Deputy Minister of Health
Miss C. Aikin	Dean, School of Nursing, The University of Western Ontario
Mr. R. Auld	Executive Director, Ontario Society for Crippled Children
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ACKNOWLEDGEMENTS

Technical support in the preparation of this report was provided through the auspices of the Research and Planning Branch of the Ontario Department of Health. Under Dr. G. W. Reid, Director, the following staff members worked with the Committee:

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Mr. W. F. J. Anderson	Executive Secretary
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Discussions were held by the Sub-committee on Laboratory Systems with:

Dr. R. Haggart	Chairman, O.M.A. Section on Clinical Pathology
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The Sub-committee on Highly Specialized Services also acknowledges the assistance provided by staff members of the Department of Health and the Ontario Hospital Services Commission, and by the many leading university, hospital, and other health personnel in the various fields studied, who contributed generously of their time and experience.

Recommendations

RECOMMENDATIONS

The recommendations of these reports are listed by category to provide a quick guide for the reader. The Ontario Council of Health has approved the recommendations as presented or has taken action as indicated.

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SECTION II – Regional Laboratory Services

In adopting the report on Regional Laboratory Services, which described concepts and principles, Council agreed that the plan as set out in the report was both desirable and practicable and approved a resolution that it be implemented by means of suitable pilot projects and studies.

*Report of Sub-committee
on Highly Specialized Services*

SECTION I

Introduction

Terms of Reference

1. The Sub-committee on Highly Specialized Services was set up as a Sub-committee of the Committee on Health Care Delivery Systems. Its broad scope was considered to be as follows:

To study and recommend on development of such services as organ transplantation and renal dialysis, within the overall framework of health services.

Organization of the Report

2. The report consists of three parts. First, the Introduction, which describes the Sub-committee's task, its method of investigation and reporting and the services considered. Second, the Comments and Recommendations, which list the main findings and recommendations of the Sub-committee related to each service, and Third, Appendix A, which contains supporting background information. The second section on Comments and Recommendations has been kept deliberately brief. Supporting testimony for Recommendations is contained, where available, in the third section—Appendix A.

Method of Committee Investigations

3. In approaching its task, the Committee reached early agreement on the definition of a highly specialized service, and on the factors involved in making provision for these services. For purposes of

deliberation, the Sub-committee defined a highly specialized health service as:

A diagnostic or therapeutic facility often directed toward one organ or disease, requiring a high level of professional expertise and/or sophisticated equipment not essential in each hospital but essential within regions of the province.

4. In examining the implications of the establishment of various highly specialized services, the Sub-committee has recognized that the elements of research and educational function are indispensable to the consideration of these services. It has also recognized the need to conserve and concentrate resources, including skilled manpower, and to provide and maintain skills at the highest level in the best interests of the patient. With these factors in mind, it has given consideration to the types of services which should be provided at the various levels of care—provincial, regional (or university medical centre), district, or community, i.e., first, second and third line services.

5. It has also been acutely aware of the imperative need to devise a system of health care delivery which will ensure rapid access of a patient to the appropriate highly specialized service.

6. In approaching its task, the Sub-committee obtained information and opinion from leading university and hospital personnel in the various fields studied, and from agencies responsible for approving the establishment of highly specialized services. It has also canvassed authorities in other provinces for their experience in these fields and reviewed the situation in other countries.

Services Considered

7. There are both distinct highly specialized services and traditional specialties within which have emerged a number of related highly specialized supporting services or subjects. The order in which these appear in the report is a matter of convenient arrangement and has no significance as to relative priority between them. Determination of priority is not possible in view of the considerable differences which exist between different areas of the province in terms of population, demography, need, availability of skilled personnel, physical resources, and the varied nature of existing provision of highly specialized services and of related highly specialized supporting services. Table 1 (following Section II) shows the location

of the distinct highly specialized services in relation to the hospitals in which they are now situated. In addition, the Sub-committee feels that it must enter a plea for the development of a number of other services which are not in themselves highly specialized, but which are considered important in making the effective use of highly specialized services possible. These are transportation services, hostel services, day care services, and social services.

SECTION II

Comments and Recommendations

HIGHLY SPECIALIZED SERVICES

1. Open Heart Surgical Units

Nine open heart surgical units are now in operation in the province. Four of these are in Toronto, and one each in London, Kingston, Hamilton, Ottawa and Sudbury. Only one team outside Toronto is doing the desirable minimum number of 50-75 operations per year. It would appear that a sufficient number of units now exists in Ontario. (It is recognized that closed cardiovascular surgery and the operation of cardiovascular investigation units may be appropriate in hospitals which do not carry out open heart surgery.)

RECOMMENDATION 1

That, when consideration is given to approving the establishment of new open heart surgical units and to the closing of existing units, study be made of such factors as population served, number of operations performed, and impact on other cardio-vascular services, and that this include educational implications.

2. Renal Transplantation Units

Six renal transplantation units are in operation in the province. Three of these are in Toronto, and one each in London, Ottawa, and Kingston.

RECOMMENDATION 2

That renal transplantation units be established only in university medical teaching centres, and that their establishment or continued operation be subject to the availability of adequately trained staff.

RECOMMENDATION 3

That the staffing of each renal transplantation unit should consist of a trained team including a urological surgeon and a nephrologist competent in the administration of immuno-suppressive therapy.

RECOMMENDATION 4

That each renal transplantation unit be established in close association with a renal dialysis unit.

3. Haemodialysis Units

Fourteen haemodialysis units are now in operation in Ontario. Of these, six are in Toronto, two in London, two in Ottawa, and one each in Hamilton, Kingston, Windsor, and Thunder Bay. New units are planned for London and Sudbury.

RECOMMENDATION 5

That haemodialysis units be established only in university medical teaching centres and in other regional or major district centres where this is warranted because of population density or distance factors (e.g. Windsor, Sudbury, Thunder Bay) and where adequately trained personnel is available.

RECOMMENDATION 6

That haemodialysis units consider the provision, under their direction, of satellite dialysis units in appropriate district hospitals, and of home dialysis programmes.

RECOMMENDATION 7

That minimal staffing of each dialysis unit include at least two technicians, two nurses, and two physicians who are adequately trained in the management of dialysis equipment, along with suitable surgical personnel.

4. Neurological and Neurosurgical Units

These two specialties of neurology and neurosurgery are interdependent and are usually integrated functionally. Highly specialized units are now located in the five medical teaching centres in southern Ontario, and some neurosurgery is undertaken in major district centres. Emergency traumatic neurosurgery in major centres other than university medical teaching centres must remain within the skills of locally available surgical and medical personnel, preferably those with training in the skills of neurosurgery, but communications from remote areas should be such that rapid transfer of patient or skilled personnel is possible.

RECOMMENDATION 8

That neurological and neurosurgical units be established only where these two specialties are present and integrated functionally.

RECOMMENDATION 9

That the following specialized supporting services be provided as a minimum in association with each neurological-neurosurgical unit: neuroradiology, electro-encephalography, echo-encephalography, and brain scanning.

RECOMMENDATION 10

That the following highly specialized supporting services (which need not be provided in each institution) be available in special centres which are capable of meeting the total needs of all units: diagnostic clinical neurophysiology, neuropathology, and neurochemistry.

5. Otolaryngology

A number of highly specialized supporting services occur within this specialty.

RECOMMENDATION 11

That the following highly specialized supporting services be made available in teaching hospitals of medical schools, but not necessarily in all such hospitals, and also to some extent in specialized institutions such as the Ontario School for the Deaf:

advanced and objective audiometry, specialized vestibular studies, speech therapy, and therapeutic ultrasonics.

RECOMMENDATION 12

That centres for specialized otolaryngological pathology in the province be situated only in a properly staffed teaching hospital laboratory of a medical faculty.

6. Ophthalmology

A diversity of highly specialized supporting services exists within this specialty.

RECOMMENDATION 13

That the following highly specialized supporting services be represented in some (not all) teaching hospitals of Ontario faculties of medicine and in selected non-university regional centres: orthoptics, and glaucoma laboratory and associated visual field analysis.

RECOMMENDATION 14

That the following highly specialized supporting services be represented in some (not all) teaching hospitals of Ontario faculties of medicine: retinal photography including angiography, retinal photo-coagulation, and contact lens clinic.

RECOMMENDATION 15

That the following highly specialized supporting services be situated in one teaching hospital or laboratory of Ontario faculties of medicine, if adequate local interest or resources are present: ophthalmic pathology, diagnostic microbiology, electroretinography, electro-oculography, ultrasonography, and low vision aid clinic.

RECOMMENDATION 16

That the following highly specialized supporting services be situated in one teaching hospital or laboratory of an Ontario faculty of medicine: eye bank laboratory, electromyography, radio-isotope

studies, medical genetics (ophthalmic) and karyotyping, dark adaptometry, specialized colour vision testing, and aniseikonia testing.

7. Paraplegic Units

This type of unit assumes growing importance with the increasing frequency of road accidents which cause spinal injuries resulting in paraplegia and quadriplegia. Most patients in a paraplegic unit fall into this category, although there are a few suffering from other ailments, e.g., multiple sclerosis, muscular dystrophy, poliomyelitis and neurological disability following head injury, which is also a common sequel of automobile accidents. Diverse skills are essential to deal with the complex problems of quadriplegia and paraplegia. These include neurosurgery, orthopaedic surgery, plastic surgery, urology, physiotherapy, occupational therapy, sociology, social work, teaching and, in particular, specialized nursing.

This unit is an essential link in the process of transition of paraplegic and quadriplegic patients from acute care to chronic care or to return to their homes with supporting community care, where necessary. At present, in the province, one large specialty unit—Lyndhurst Lodge, Toronto—exists for this purpose.

RECOMMENDATION 17

That, in order to attract staff of requisite training and calibre, paraplegic units be 20 beds or more in size.

RECOMMENDATION 18

That paraplegic units be sited only within regional centres, and only where warranted by area population.

8. Burns Units

Patients with second or third degree burns, involving 10 per cent or more of the body with adults and 7 per cent or more with children, require admission to a burns unit. Burns of less severity may well be treated in hospitals with less specialized facilities, but severe cases should be referred to a formally organized unit. In addition to caring for patients with burns, a research programme may be sustained by such a unit, which should also be associated with a plastic surgery department.

RECOMMENDATION 19

That, depending on area need, one or more burns units be developed in each regional centre of the province.

9. Hyperbaric Units

One hyperbaric unit is situated at the Toronto General Hospital, one small unit is in Victoria Hospital in London, and a portable unit belonging to the Armed Forces is situated at Downsview in Toronto. In addition, the Workmen's Compensation Board has trained teams available for deployment to tunnelling sites, with fast ambulance service to Toronto General Hospital. The portable unit is available to civilians on request. The Toronto General Hospital Unit is fully staffed with trained personnel, is capable of providing a round-the-clock service every day of the year, and can arrange for air transport to the unit from all parts of the province. This unit, with the support of the other two services, appears to be adequate for the present time.

RECOMMENDATION 20

That no additional hyperbaric units be established at this time.

10. Rheumatic Disease Units

The widespread application of measures of treatment now known to medical science would significantly reduce the extent and degree of disability due to arthritis and other rheumatic diseases. Special units are required for improved standards of medical care, for basic and clinical research, and for educational activities related to the development of specialists and of other doctors and allied health personnel in the field of rheumatology. A need may also exist for a paediatric rheumatic unit.

At present, five rheumatic disease units exist in Toronto, one in Hamilton, and one in London. New units are planned for Kingston and Ottawa.

RECOMMENDATION 21

That a unit consist of 20 to 40 beds in a teaching hospital, segregated for the care of arthritic patients, with associated research and teaching space, directed by a competent staff of rheumatologists and other specialists.

RECOMMENDATION 22

That rheumatic disease units be developed in each of the medical schools, and in major district centres where warranted by area need and where suitably trained staff is available.

RECOMMENDATION 23

That one provincial medical school establish a paediatric rheumatic unit in a children's hospital on an experimental basis to evaluate its achievement.

11. Clinical Investigation Units

A clinical investigation unit has several functions. A few beds in it may be set aside for intricate metabolic balance studies, but most are used for the close observation necessary for certain diagnostic purposes in the ordinary practice of internal medicine and of other specialties. The unit may also serve in the evaluation of new drugs. Although patients do not require intensive nursing care, nursing staff on the unit should be accustomed to the discipline of investigative procedures, where fixed diets and the collection of 24-hour body excrement are common.

RECOMMENDATION 24

That clinical investigation units be established in university or major affiliated hospitals in medical teaching centres, but not necessarily in all such hospitals.

RECOMMENDATION 25

That, in selected other regional and major district centres, an area of a hospital ward be designated as a diagnostic study area, where special diagnostic procedures can be carried out.

RECOMMENDATION 26

That clinical investigation units be established only where there are available:

- a. properly trained staff including specially trained nurses, a physician trained in clinical investigation;*
- b. adequate supporting facilities including 10 to 12*

beds as a separate entity or as part of a metabolic ward, a special diet kitchen, an aliquot room, a procedures room and a special laboratory.

12. Gastro-intestinal Units

Gastro-intestinal disease can generally be treated as part of internal medicine in most hospitals. A case may exist, however, for the establishment of gastro-intestinal units to which patients can be specially referred for advanced investigation and treatment. These highly specialized units should be in teaching hospitals only.

RECOMMENDATION 27

That a gastro-intestinal unit be established only where, in addition to the usual diagnostic facilities of a major district hospital, there is access to special supporting laboratory, radiological, nuclear medical and surgical services necessary for the advanced diagnosis and treatment of gastro-intestinal disease.

RECOMMENDATION 28

That gastro-intestinal units be established in university teaching hospitals and in other appropriate hospitals in regional centres.

13. Radiotherapy Units

Radiotherapy units are located in Toronto, Hamilton, London, Ottawa, Kingston, Windsor, and Thunder Bay. Consultative and follow-up clinics are more widely distributed, not only in those seven centres but also in 19 other district centres throughout the province. Both clinics and units are associated with local public hospitals. No radiotherapy unit exists in north-eastern Ontario—a deficiency which should be remedied. In view of their dominant role in the treatment of cancer, radiotherapy units should also undertake cancer chemotherapy under the aegis of a specially trained physician. Strict control of building requirements and of the qualifications of the physician-in-charge is exercised by licence of the Atomic Energy Commission on the advice of the Radiation Protection Division of the Department of National Health and Welfare. This should continue.

RECOMMENDATION 29

That encouragement be given to the appropriate

authorities for the development of a radiotherapy unit in north-eastern Ontario.

RECOMMENDATION 30

That units which provide only radiotherapeutic services be encouraged also to provide chemotherapeutic services under a physician with special interest and training in this field.

14. Radioactive Isotope Units

Forty-six units are in operation in the province, in district as well as regional hospital centres. They perform all or some of the following functions: organ scanning, isotope renography, thyroid function studies and treatment of thyroid disease, haematologic studies, body compartment studies, gastro-intestinal blood loss using labelled red blood cells, radio-immunoassay, and radiation safety. As with radiotherapy units, strict control of building requirements and of the qualifications of the physician-in-charge is exercised by licence of the Atomic Energy Commission on the advice of the Radiation Protection Division of the Department of National Health and Welfare. This should continue. One facility exists in the province for whole-body counting, at Toronto General Hospital.

RECOMMENDATION 31

That the establishment of a radioactive isotope unit, the type of unit, and the type and amount of equipment provided in a unit, be related to area need, and that small units in district centres be approved for diagnostic purposes only.

RECOMMENDATION 32

That the facilities necessary for a diagnostic and therapeutic unit be considered to include an organ scanning area, a laboratory, a radio-iodine uptake area, a blood-letting space, a counting facility, a radio pharmacy, and a radioisotope administration area.

RECOMMENDATION 33

That there be only two whole-body counting units, which require enclosure in a shielded room, in the province.

15. Intensive Care Units

Forty-seven intensive care units are in operation, in district as well as in regional hospital centres. These units are established to provide care for patients whose lives would be threatened by the absence of constant intensive care or monitoring. They should be established only in appropriately sized hospitals and should not be of less than four beds. The criterion of 3.5 per cent of medical-surgical beds should be used to determine the size of an intensive care unit. In larger institutions, special purpose intensive care units have been established, for example, coronary care units and respiratory units.

RECOMMENDATION 34

That intensive care units be established in appropriately sized hospitals, using the criterion of 3.5 per cent of medical-surgical beds, and that no intensive care unit be of less than four beds.

RECOMMENDATION 35

That, in instances where the percentage formula does not justify the minimum number of four beds, consideration be given to the designation of a multi-purpose room for constant care, including monitoring, to be situated near the nursing station.

RECOMMENDATION 36

That separate special purpose intensive care units (coronary care, respiratory failure, and perinatal) be established only if the population served makes each unit viable as a separate entity, and only where trained staff is available.

16. Coronary Care Units

A non-fatal attack of myocardial infarction (coronary thrombosis) may be followed within a short time by complications, such as disorders of the rhythm of the heart, leading to cardiac arrest, shock, and congestive cardiac failure.

For this reason, it is desirable that patients admitted to hospital with a presumptive diagnosis of myocardial infarction be placed under surveillance in *specially and adequately staffed* coronary care units, both for confirmation of diagnosis and for recognition and treatment of arrhythmias and of cardiac arrest.

Continuous monitoring of heart action offers the best method of detection of complications. Restoration of normal heart action must be achieved within three minutes of arrest to avoid permanent brain damage. Equipment for the unit should, therefore, include monitors and defibrillators.

In many hospitals this work can be carried out in the intensive care unit or in a multi-purpose room equipped for monitoring and defibrillation.

Where a hospital is of sufficient size, it may consider the establishment of a separate coronary care unit. Criteria for this should be (a) a case load of myocardial infarction sufficient to produce a bed occupancy of 70 to 85 per cent throughout the year in a unit of (b) not less than three and not more than eight beds for (c) an average length of stay of five days.

Twenty-eight separate coronary care units operate in the province. Twenty-two more units are in various stages of planning.

RECOMMENDATION 37

That, where a separate coronary care unit is not considered necessary, intensive coronary care be part of the function of a hospital's intensive care unit or of a multi-purpose room for constant care.

RECOMMENDATION 38

That criteria for establishment of a coronary care unit be a case load of myocardial infarction sufficient to produce a bed occupancy of 70 to 85 per cent throughout the year, in a unit of not less than three and not more than eight beds for an average length of stay of five days.

RECOMMENDATION 39

That in both intensive care units and coronary care units there be adequate equipment and trained staff to provide:

- a. monitoring and surveillance of cases of myocardial infarction;*
- b. prompt treatment of cardiac arrest.*

17. Respiratory Failure Units

Respiratory failure is one of the most common problems to be treated in an intensive care unit. Whether a separate respiratory failure unit should be established depends on the specific hospital situation.

RECOMMENDATION 40

That each regional centre in the province be encouraged to develop one or more respiratory failure units, depending on area need and the other qualifications listed in Recommendation 36.

RECOMMENDATION 41

That each non-teaching hospital of over 400 beds be encouraged, with the help of the Ontario Hospital Services Commission, to attract to its staff a general physician with an understanding of respiratory function who is capable of performing elementary tests of pulmonary function.

18. Pulmonary Function Laboratories

The development of pulmonary function tests and the increasing utilization of these tests in research and clinical practice is causing rapid changes in the treatment of patients with respiratory disease. Pulmonary function laboratories are basically of two types—service and research. The service laboratory deals with objective measurement of bronchopulmonary function in disease. The research laboratory, in addition to its research role, also carries a heavy service load. In view of increasing morbidity and mortality from respiratory disease, pulmonary function research laboratories assume increasing importance.

RECOMMENDATION 42

That each major respiratory failure unit have a supporting pulmonary function service laboratory.

RECOMMENDATION 43

That pulmonary function service laboratories be an integral part of every teaching hospital.

RECOMMENDATION 44

That encouragement be given to the development of

pulmonary function service laboratories in district hospitals where no respiratory failure unit exists.

RECOMMENDATION 45

That pulmonary function research laboratories be limited, in general, to university centres, preferably in large teaching hospitals.

19. Genetic Counselling, Chromosomal Analysis, and Metabolic Screening

Advances continue to be made in genetic determination of hereditary disease. Primary genetic counselling occurs at the level of the doctor's office and out-patient department. Adequate counselling should, however, be supported by the techniques of biochemistry, cytogenetics, and immunology, along with facilities for chromosomal analysis and metabolic screening. This secondary service should be provided by pathologists at district and regional levels. In the delivery of counselling services, existing university centres should act at a "tertiary level," developing improved technical and educational liaison with all outlying hospitals and with the province's physicians.

RECOMMENDATION 46

That undergraduate, postgraduate and continuing education of physicians contain instruction in genetic counselling to enable primary delivery in out-patient departments and doctor's offices.

RECOMMENDATION 47

That pathologists of all district and regional hospitals function at a secondary level for routine karyotypes and limited metabolic screening.

RECOMMENDATION 48

That university-based laboratories be available for the advanced interpretation entailed in certain types of counselling.

RECOMMENDATION 49

That a provincial committee be established and maintained to survey available resources in genetic counselling, to determine immediate tasks in that field, and to develop long-range plans for the establishment and function of a province-wide

organization to provide assistance with problems of detection, management, and prevention of genetically determined disease.

20. Perinatal Units

Intensive maternal and newborn care can predict 80 per cent of all newborn mortalities and may prevent an increasing number of these. Perinatal transport arrangements are necessary, as are arrangements for the transportation of high risk mothers to the perinatal centre prior to the delivery date.

RECOMMENDATION 50

That regional perinatal (obstetric/paediatric) units be set up at strategic locations throughout the province, usually, but not necessarily, in medical teaching centres.

RECOMMENDATION 51

That the existing Provincial Perinatal Mortality Study Committee be expanded; that its title, membership, and terms of reference, be reviewed in the light of current needs of the Department of Health for advice on matters beyond the study of perinatal deaths, and that a primary function of this committee be the surveillance of perinatal mortality and perinatal morbidity.

21. Learning Disabilities

Up to 15 per cent of school children have some degree of learning disability which, by early identification, may be helped by special teaching methods. Secondary emotional and behavioural changes may be greatly reduced by such early identification. The District Health Units are often appropriate agencies for the necessary medical examination and screening and, accordingly, should employ a physician to provide the following services:

- (a) Placement and supervision of pupils with learning disabilities.
- (b) Consultation with other public health medical and nursing staff, and with psychiatrists with suitable paediatric orientation, to provide ongoing educational services for members of the medical profession unfamiliar with learning disabilities.

- (c) Continuing liaison with all educational authorities.

RECOMMENDATION 52

That the Medical Officer of Health of each Health Unit have available on his medical staff a physician, preferably with paediatric training, who is capable of supplying medical examinations and information regarding learning disabilities to the County School Boards.

22. Cerebral Palsy

Centres for the therapy and special education of children with handicapping conditions such as cerebral palsy exist in a variety of locations throughout the province. Diagnosis and assessment of children is undertaken by mobile teams of physicians from the appropriate university centre, by the Ontario Society for Crippled Children, who travel to outlying areas on the request of local physicians. More northerly areas with sparse population and small demand are rarely visited by these teams.

RECOMMENDATION 53

That the Department of Health encourage physicians and medical groups in outlying areas to invite the Ontario Society for Crippled Children, or other appropriate agency, to provide clinics for the detection and initial therapy of handicapping conditions such as cerebral palsy, on a regular basis.

RECOMMENDATION 54

That treatment services be expanded to allow several days admission to hostel accommodation where appropriate during the initial period of investigation, under Ontario Hospital Services Commission benefits or with other provincial support.

OTHER SERVICES

There are a number of other services which, although not in themselves highly specialized, are important if effective use of highly specialized services is to be made.

23. Transportation Services

Adequate transportation facilities are essential to the effective use of highly specialized services. These should be instantly available, specially equipped and adequately manned by trained ambulance personnel who may have to be reinforced by skilled personnel such as specialist physicians and surgeons when necessary.

RECOMMENDATION 55

That there be developed in all parts of the province adequately manned and equipped highway and air ambulance services to permit rapid movement of high risk patients to special treatment units (e.g., neurological-neurosurgical units, respiratory failure units, perinatal centres) or to permit movement of skilled personnel to the patient when this is necessary.

24. Hostel Services

Utilization of highly specialized services can be facilitated and in-patient hospitalization reduced if hostel accommodation is made more available. This type of provision not only promotes better turnover in highly specialized units but also enables those patients who come long distances for one treatment (as, for example, in radiotherapy) to have appropriate rest without occupying an expensive hospital bed.

RECOMMENDATION 56

That hostel accommodation or similar arrangements be established with provincial government financial support, either through new construction or through renovation of existing facilities, in regional and district centres in which highly specialized services are situated.

RECOMMENDATION 57

That patient stay in hostel accommodation be an insured benefit under the Hospital Insurance Plan, or receive other provincial government support.

25. Day Care

There is a clearly discernible need for day care in the fields of

geriatrics and psychiatry to offset the detrimental effects of two stark alternatives—long-term institutionalization on the one hand and inadequate support in the patient's own home on the other. To be effective in those fields, day care facilities should include a wide range of services for rehabilitation and prevention of deterioration.

Unnecessary short-term institutionalization also occurs in other fields of medicine and surgery. This is undesirable on both human and financial grounds. Spiralling costs and advancing medical technology make it imperative for hospitals to perform procedures on in-patients only when in-patient treatment must be undertaken. Consideration should be given to wide-spread establishment of day care facilities and organization of the necessary supporting community teams so that a wide range of medical investigations and surgical procedures on a day care basis may be undertaken. A special need for this exists in the treatment and stabilization of diabetes mellitus.

RECOMMENDATION 58

That there be a review of hospital procedures with a view to classifying certain medical investigations and surgical operations as suitable for day care practice.

RECOMMENDATION 59

That comprehensive day care programmes be developed in the various fields of medicine.

26. Social Services

Hospitals are highly successful in attaining cure of disease where this is feasible, or improvement of condition where this, but not cure, is possible. Studies have demonstrated that this achievement is vitiated or nullified, however, by return of patients to adverse environmental conditions leading to early relapse or even premature death.

The various highly specialized services described earlier are costly to provide and to operate. In the interests of economy—and of humanity—it is imperative that their benefits should be consolidated, not lost.

It is appropriate, therefore, to emphasize the importance of social service support. To be effective, this should be undertaken by one organization which will *co-ordinate* and *direct* intramural and extramural activities in this sphere. There is a danger of failure to

provide the right kind of service—in some instances, any kind of service—where the organization concerned is based solely in either hospital or community or where there is a multiplicity of social agencies.

The details of organizational structure are beyond the scope of this Sub-committee but these two points—the urgent need for effective social service support to hospital work, and of its co-ordination by *one* organization—require strong emphasis.

RECOMMENDATION 60

That, to consolidate the benefits of highly specialized and other services to patients, effective social service support to hospital work be planned and provided.

RECOMMENDATION 61

That, to be effective, social service support, both within and outside hospital, be co-ordinated.

TABLE I
LOCATION OF HIGHLY SPECIALIZED SERVICES BY HOSPITAL

Region and City	Hospital	Hyperbaric Oxygen Unit	Open Heart Surgical Unit	Renal Transplantation Unit	Haemo-dialysis (Chronic)	Paraplegic Unit	Radiotherapy Unit	Radioactive Isotope Unit	Intensive Care Unit
I LONDON									
Chatham	Public General								*
London	St. Joseph's				*			*	*
	St. Joseph's		*		*		*		*
Goderich	Victoria	*		*					*
St. Thomas	Alexandra Marine								*
Sarnia	St. Thomas Elgin							*	*
	Sarnia General							*	*
Stratford	St. Joseph's							*	*
Windsor	Stratford General							*	*
	Hotel Dieu						*		*
	Metropolitan General				*				*
	Salvation Army Grace								*
II HAMILTON									
Brantford	Brantford General							*	*
Galt	South Waterloo Memorial								*
Hamilton	Hamilton General		*					*	*
	Henderson General				*		*		*
Grimsby	St. Joseph's								*
	West Lincoln Memorial								*

TABLE I (continued)

Region and City	Hospital	Hyper- baric Oxygen Unit	Open Heart Surgical Unit	Renal Trans- plantation Unit	Haemo- dialysis (Chronic)	Para- plegic Unit	Radio- therapy Unit	Radio- active Isotope Unit	Intensive Care Unit
Kitchener	Kitchener-Waterloo								*
Niagara Falls	St. Mary's General							*	*
St. Catharines	Greater Niagara General							*	*
Welland	St. Catharines General							*	*
Guelph	Welland County General								
Simcoe	St. Joseph's								*
	Norfolk General								*
III TORONTO									
Ajax	Ajax and Pickering							*	*
Barrie	Royal Victoria							*	*
Brampton	Peel Memorial							*	*
Burlington	Joseph Brant Memorial							*	*
Collingwood	Collingwood General								
	and Marine								
Cooksville	South Peel							*	*
Downsview	Armed Forces Base	*							
Newmarket	York County								*
Oakville	Oakville-Trafalgar							*	*
Orangeville	Dufferin Area							*	*
Oshawa	Oshawa General							*	*
Scarborough	Scarborough Centenary							*	*
	Scarborough General							*	*

TABLE I (continued)

Region and City	Hospital	Hyperbaric Oxygen Unit	Open Heart Surgical Unit	Renal Transplantation Unit	Haemodialysis (Chronic)	Paraplegic Unit	Radiotherapy Unit	Radioactive Isotope Unit	Intensive Care Unit
Toronto	East General		*	*				*	*
	Hospital for Sick Children								
	Lyndhurst Lodge					*		*	
	New Mount Sinai								
	Northwestern						*		*
	Princess Margaret							*	*
	Queensway (Etobicoke)							*	*
	St. Joseph's		*		*			*	*
	St. Michael's		*		*			*	*
	Sunnybrook		*		*			*	*
	Toronto General		*	*	*			*	*
	Toronto Western		*	*	*			*	*
	Wellesley							*	*
	Women's College							*	*
Weston Willowdale	Humber Memorial							*	*
	North York Branson							*	*
IV KINGSTON	North York General								*
									*
Cobourg Belleville Kingston	Cobourg District General								*
	Belleville General							*	*
	Hotel Dieu		*		*		*	*	*
	Kingston General		*		*		*	*	*

TABLE I (continued)

Region and City	Hospital	Hyper- baric Oxygen Unit	Open Heart Surgical Unit	Renal Trans- plantation Unit	Haemo- dialysis (Chronic)	Para- plegic Unit	Radio- therapy Unit	Radio- active Isotope Unit	Intensive Care Unit
Peterborough	Peterborough Civic -								*
Brockville	St. Joseph's General						*		*
	General								*
V OTTAWA	St. Vincent de Paul						(Super- ficial)		*
Cornwall	Hotel Dieu			*	*		*	*	*
Ottawa	Ottawa Civic		*		*		*	*	*
	Ottawa General								
	Riverside								
VI N.W. ONTARIO									
Thunder Bay	McKellar General				*		*	*	*
	Port Arthur General						*	*	*
	St. Joseph's								
VII N.E. ONTARIO									
North Bay	St. Joseph's							*	*
Sault Ste. Marie	General							*	*
	Plummer Memorial Public							*	*
	Sudbury General							*	*
Sudbury	Sudbury Memorial		*					*	*
	St. Joseph's								

Appendix A

BACKGROUND INFORMATION

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No Information Included for:

Highly Specialized Services

- Hyperbaric Units
- Intensive Care Units

Other Services

- Hostel Services
- Day Care
- Social Services

PREFACE

The material included as background information is intended to provide more detail than is incorporated in the main body of this report. It has been selected from the many reports and pieces of correspondence from university, hospital, and other health personnel whose contributions were reviewed by the Sub-committee in the course of preparing its report.

SECTION I

Open Heart Surgical Units

Extracts from the Report of the Interhospital
Cardiovascular Surgical Committee, Toronto, Ontario.
Prepared by Dr. W. G. Bigelow, January 1969.

Background and Present Organization

Between 1947 and 1958 the Toronto General Hospital, Hospital for Sick Children, St. Michael's Hospital and the Toronto Western Hospital established Cardiovascular Surgical Services. There has always been excellent interhospital communication both unofficially and by the Toronto Cardiovascular Society (new section of the academy) which was designed for this purpose.

All four Cardiovascular Services have carried out open heart surgery for about ten years. There has never been any departmental policy regarding the surgical activities of these units. The only thing approaching this has been: (1) the policy not to encourage the establishment of cardiovascular services that were not prepared to do open heart surgery and (2) not to encourage the establishment of paediatric cardiovascular surgical services in any of the adult teaching hospitals.

Three Toronto University Hospitals have appointed members of the Cardiovascular Surgical Division of the Toronto General Hospital to their staff as consultants. These men consult, carry out carefully selected closed heart surgical operations in these hospitals. This

proves a benefit to the hospital in a number of ways including teaching of students and nurses.

Sunnybrook Hospital	—	Dr. J. A. Key
Wellesley Hospital	—	Dr. R. O. Heimbecker
Women's College Hospital	—	Dr. W. G. Bigelow

The New Mount Sinai Hospital has made no special commitments to any cardiovascular surgical division in the city. Some of their cardiologists attend the Toronto General Hospital weekly combined rounds and one attended the Cardiovascular O.P. Clinic for several years as a member of the O.P.D.

Peripheral Vascular Surgery

Techniques in peripheral vascular surgery have been reasonably standardized in the last three to four years. It is the opinion of the committee that this work should be shared by certain general surgeons in the teaching hospitals who are interested and qualified. This should increase the resident contact with this specialty.

In the past, the cardiovascular surgical services of the adult hospitals have trained general surgeons in peripheral vascular surgery who are now doing the aortic aneurysm and peripheral vascular surgery along with their general surgery in several cities in Ontario.

Should There be More Open Heart Surgical Units in the University of Toronto Hospitals

In June 1967, two memoranda were submitted to Professor Drucker assessing the current and future status of cardiovascular surgery in Toronto. Some of the opinions were the result of a special Ontario Hospital Services Commission survey of open heart surgeons in Ontario requested by Drs. Wigle, Wilson and Bigelow in 1963.

The need or advisability of setting up and supporting more open heart cardiovascular surgical teams in Toronto may be judged using the criteria adopted by the Cardiovascular Surgical Council of the American Heart Association in association with the National Institute of Health. These are (1) the basis of population and (2) current surgical case load in existing hospital units.

(1) **Population:** The American Heart Association study concluded that one open heart team required a population of three-quarter to one million. Sweden recommends one million.

The 1968 population of Ontario was seven and one-quarter million. In 1968 there were nine functioning open heart teams in Ontario. This would appear to be a good relationship. These teams lose patients to the U.S.A. but they gain patients from the Maritimes.

(2) **Case load of existing “open heart” teams:** A study of the case load of Ontario Heart Surgical teams was made for our 1967 report and brought up to date recently. On a provincial basis this should reflect in a general way the available clinical material.

The American Heart Association and the National Institute of Health study concluded that an open heart team should complete a minimum of 50 to 75 operations per year in order to maintain the efficiency of the team.

The following table summarizes the situation in Ontario:

Team	Open Heart Operations	
	1966	1968
Hospital for Sick Children – Toronto	121 [*] (+ 176) = 297	127 [*] (+ 180) = 307
Toronto General Hospital	156	206
St. Michael’s Hospital	32	51
Toronto Western Hospital	50	60
London, Ontario	78	86
Kingston, Ontario	20	38
Hamilton, Ontario	12	32
Ottawa, Ontario	2	40
Sudbury, Ontario	0	12

* Hypothermia

This is the first year that all four Toronto teams reached the minimum case load. There is only one team outside of Toronto that is doing over the recommended minimum number of operations per year.

This would logically suggest that there are a sufficient number of teams in Ontario at present. However, adequate determination and organization could enable a new unit to flourish in the face of these statistics and with current population trends it would be most useful in Toronto. In defence of the multiple duplicate units system, it has been suggested that teaching hospitals may benefit from having a Cardiovascular Surgical Division.

The attitude of the Ontario Hospital Services Commission towards financing new units and the double problem of obtaining a sufficient number of qualified residents and training too many specialty surgeons, would have to be met.

Human Heart Transplantation

This committee recommends the appointment of one or more transplantation immunologists as soon as possible, with plans for a comprehensive laboratory for the study of "transplantation" immunology. These men should be housed in the Medical Sciences Building in association with the Department of Microbiology until a Department of Immunology is formed. Their services should be available to all hospital cardiovascular units with dual appointments where it is indicated.

Although the decision to carry out "standard definitive and palliative surgical operations" may be currently considered the jurisdiction of the individual university hospital, it is this committee's opinion that operations that are classified as "experimental human surgery" should be considered in a different category. Authority to proceed with such studies should come from the University Department of Surgery and from the University Committee on human experimentation.

General Concepts and Future

The "President's Bill for Heart, Cancer and Stroke" which requested 2.94 billion dollars for five years was passed by the United States Senate and Congress in October 1965 with an appropriation of 1/3 billion dollars for three years—1966-1968. In July 1968 because of the success of the programme, a further 1/4 billion was authorized to continue the programme to 1970. Among other things this establishes heavily endowed "regional heart complexes" and "regional special centres" in association with existing hospitals and universities.

In your committee's report of 1967 one of the two alternatives (which was suggested but not recommended) for the future, was the establishment of a central University of Toronto Cardiovascular centre or complex with concentration of refined equipment and expert personnel working with related disciplines. The vastness of the money available for such purposes in the United States and the forward thinking and planning in progress suggests that a committee should be formed to study the impact of this incredible health programme on the future of cardiovascular medicine, surgery and research in Canada.

Editorial by Dr. B. Eiseman and Dr. F. C. Spencer,
Circulation, Volume XXXI, No. 2,
February 1965.

The Occasional Open-Heart Surgeon

"If I miss a day of practice I can tell a difference in my technique. If I miss two days my wife can also note it. If I miss a week even the public can tell." So said Paderewski. Most surgeons would agree that in this respect their operative skill is analogous to that of the concert pianist.

In well-standardized low-risk operations, where the benefits of long historical experience have provided a ritual of technique, even the occasional surgeon can dabble as an amateur with some safety for his patient. This does not apply, however, for the still hazardous and complex field of open-heart surgery. Complex diagnostic techniques, precise preoperative preparation, a well-trained pump and O.R. nursing team, as well as devoted and experienced surgical assistants combined with a skilled open-heart surgeon, can only achieve success if, as a group, they maintain constant practice.

A recent study by Annemarie Crocetti in the School of Public Health at Johns Hopkins, for the first time documents just how the average heart team maintains its experience in the United States. She contacted the Hospital Administrators in 6,988 hospitals of all types regarding the availability and experience during 1961 of four techniques: cardiac catheterization, angiocardiology, closed-heart surgery and open-heart surgery.

TABLE I
Cardiac Diagnostic and Surgical Facilities in 6,988 Hospitals
within the United States, 1961

Type procedure	No. Hosp. reporting such facilities	Cases per year									
		None		1-9		10-49		More than 50		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%
Cardiac catheterization	513	94	18	77	15	141	28	189	37	12	2
Angiocardiography	649	214	33	169	24	153	22	92	13	21	3
Open-heart	327	37	11	97	30	117	36	56	17	20	6
Closed-heart	777	229	30	333	43	142	18	44	6	29	4

Table I summarizes the most pertinent part of her findings. One thousand and fifty-two hospitals maintain one or more of these services. Seven hundred seventy-seven hospitals claimed closed-heart facilities and 327 maintained an open-heart team. Of greatest interest was the finding that 73 per cent of the institutions claiming closed-heart, and 41 per cent having open-heart teams, recorded less than 10 such procedures in a year.

The precise definition of an occasional surgeon is open to discussion, but few would argue that a team can keep an optimum degree of training doing less than one case a month. Not revealed, of course, is the far more elusive figure relating operative mortality with the frequency of operation. Its correlation must be left to the imagination!

Many factors still push individuals and institutions into the field of open-heart surgery. Unfortunately, it maintains a totally undeserved role as a professional status symbol. Fortunately, as its more lethal, complex and expensive features become appreciated by surgeons and their critical referring cardiologists, the compulsions to get into open-heart surgery begin to wane. The grief and heartaches to both patient and surgeon become appreciated along with the occasional spectacular triumphs.

Those who follow the fads have, for the most part, already dropped open-heart surgery as they pursue the flitting spotlight into gastric freezing, kidney transplants, and into the empty vastness of high-pressure chambers. Open-heart surgery is well rid of these idle camp followers, for this specialty, like any other, only has room for the serious student of its problems and techniques.

It is to be hoped that another, and perhaps annual, study will be undertaken to quantitate the current number of closed- and open-heart teams and their frequency of operation. Such study, plus cognizance of acceptable mortality for the more standardized open-heart procedures, will go far toward improving the overall care of patients requiring open correction of cardiac defects.

SECTION II

Renal Transplantation Units, Haemodialysis Units

Extracts from a letter from Dr. C. J. Robson,
Head, Division of Urology, Toronto General Hospital,
Toronto, Ontario, to Dr. W. G. Bigelow, April 24, 1969.

The following points have now been fairly well established:

1. Renal transplantation can be carried out in any well equipped hospital where there is a trained team of a urological surgeon and a nephrologist, who is competent in the administration of immuno suppression and where there is ready access to a renal dialysis unit. Obviously, where research is being carried out to any degree, the team will have to be larger. This will be limited pretty well to the university centres.
2. As far as the question of Haemodialysis Units are concerned, Ontario has a population of roughly 7 million and it has been fairly accurately shown that approximately 25 people per million are suitable candidates for this type of programme. This would therefore mean that roughly the provincial programme should support 175 to 200 people per year. At the present time, the Teaching Hospitals in Toronto are maintaining roughly 50 patients on the Chronic Dialysis Programme. Population-wise, this would appear to be the correct number, but a lot of these are from rural Ontario.
3. With the ambulatory type of Chronic Dialysis Programme, it would appear that the patient should not be any further than

perhaps 40 miles from the Renal Dialysis Unit, although this is not going to be possible in all cases. At the present time, Dialysis Units are located at Ottawa, Kingston, Toronto, Hamilton, London, which really leaves the northern part of Ontario uncovered and also the far western. From the population point of view, I would think that an additional centre should be located at the Lakehead and also in Sudbury. While North Bay is perhaps closer to the centre of the area because of the population spread, I think Sudbury would be more suitable.

4. It must be emphasized at this point, that although a renal dialysis equipment is relatively inexpensive, it takes a trained personnel and I must emphasize dedicated personnel to run a Dialysis Unit. Depending on the type of equipment used, at least 2 technicians and at least 2 nurses and 2 physicians who are adequately trained in the management of the dialysis equipment, plus a surgical personnel who will put in the arteriovenous shunts, or create the arteriovenous fistulae. If procurement of equipment is easy, that of suitable personnel is most difficult.

5. It might also be pointed out that although patients for the dialysis programme in this centre and most of the others, are chosen because of their suitability for a possible transplant, nevertheless, there are patients who are not suitable, but who could carry on quite well on Home Dialysis Units. The economics of this of course are quite apparent because a Home Dialysis Unit costs approximately \$3,000.00 whereas it costs between \$8,000.00 and \$10,000.00 per patient to keep them on Central Dialysis Programme in any hospital. The advantage of Home Dialysis also becomes very apparent when one realizes that we must have more potential recipients in order to effectively use our donor potential with optimum tissue typing.

SECTION III

Neurological and Neurosurgical Units

Extracts from a letter from Dr. J. C. Richardson,
Professor of Medicine (Neurology) University of Toronto,
Toronto, Ontario, to Dr. D. A. Rosen, May 6, 1969.

Neurology constitutes a rather large specialty. In a general medical hospital service the diseases of the nervous system usually contribute 20-30% of the total. It has been estimated that the requirement of neurologists is 1 per 75,000 of population (and neurosurgeons 1 per 150,000). It deserves mention that a major function of the medical neurologist is to keep patients out of hospital. By office or clinic consultations the experienced neurologist can diagnose many problems which a less skilled physician might subject to many unnecessary special diagnostic procedures.

The hospital practise of neurology requires collaboration with neurosurgery. The beds of these services can be mixed or adjacent. Neurology and neurosurgery share various ancillary services including electro-encephalography, echoencephalography (ultrasound), electromyography, neuroradiology, radioisotopic brain scanning, neurochemistry and neuropathology.

The following are the neurological facilities at the Toronto University teaching hospitals, (presented approximately without having been checked in detail).

Toronto General Hospital—Neurological unit 31 beds and about

50 scattered beds on medical units. Staff of 6 neurologists with resident staff of 4 or 5. Adjoining neurosurgical unit 50 beds. Neuroradiologists 2, with full equipment for air studies, angiography, myelography, etc. E.E.G. Department with electromyography and echoencephalography in same hospital area with neurological and neurosurgical units. Close university affiliation with divisions of neurophysiology, neurochemistry and neuroanatomy.

Toronto Western Hospital—Combined neurology and neurosurgery service of about 40 beds, as well as beds on medical wards. Three neurologists, 2-3 assistant residents, 1 neuropathologist, E.E.G. Department, 1 neuroradiologist, (2 neurosurgeons).

St. Michael's Hospital—Combined neurology-neurosurgical bed area, about 45 patients. Staff of 3 neurologists (and 3 neurosurgeons), 2 assistant residents, E.E.G., E.M.G. and neuroradiology facilities.

Sunnybrook Hospital—About 40 beds on neurology service. Two staff neurologists and 2 assistant residents. Visiting neurosurgeons.

Wellesley Hospital—About 20 neurological beds. Staff of 2 neurologists (1 assistant resident), 2 neurosurgeons.

New Mount Sinai Hospital has a staff of 2 neurologists with 1 assistant resident trainee in neurology, and carries a bed service of about 30. This service works closely with that of the Toronto General Hospital.

Women's College Hospital has 2 neurologists and limited diagnostic facilities. Neurosurgery is done chiefly at the Toronto General Hospital.

The Hospital for Sick Children has a big and full equipped service of paediatric neurology with a consultant staff of 4, and with large associated neurosurgical service. Full x-ray and laboratory services are available.

In the other non-teaching hospitals in Toronto there are further neurological (and neurosurgical) facilities and staff. St. Joseph's Hospital has 3 neurologists and visiting neurosurgeons. Toronto East General Hospital—1 neurologist, 1 neuropsychiatrist. Scarborough General and Centenary Hospitals—2 neurologists. Northwestern General and North York Hospitals—1 neurologist and 1

neurosurgeon. There are E.E.G. and limited x-ray facilities at these and other outlying hospitals.

In Ontario neurology has become established as a special and essential field of medicine, and the medical profession is accustomed to the routine use of neurological consultants. The full practice of specialist and consultant neurology requires the association with neurosurgery, and the complex and elaborate diagnostic equipment and staff mentioned above. The top level of academic and consultant neurology also demands the association and facilities of a department of internal medicine and of other specialties such as ophthalmology and otolaryngology.

Aside from academic neurologists with full and complete neurological facilities, there is a useful scope for neurological specialists practising in less urban regions and sending along the more complicated problems to larger centres.

**Extracts from a letter from Dr. C. G. Drake,
Professor and Chairman, Department of Clinical
Neurological Sciences, University of Western
Ontario, London, Ontario, to Dr. D. A. Rosen,
May 8, 1969.**

You will be aware that the first Neurosurgical Unit in Canada was established under Dr. Kenneth McKenzie in Toronto in the early twenties and remained the only major unit until 1952 when a second unit was opened at Victoria Hospital, London. Very quickly this became a large active service involved in all aspects of neurosurgery, as far as service, teaching and clinical research were concerned. For many years the unit has been fully approved by the Royal College and has been actively engaged in the training of young neurosurgeons.

In the beginning, neurosurgery was restricted to Victoria Hospital. However, largely due to the dispersement of trauma in the city, a few brain and spine injured patients were cared for at St. Joseph's Hospital, as well as discs and the occasional biopsy of a tumor—what I call the “general practice” of neurosurgery. A small neurological service was established there also. The major problems of neurosurgery continue to be transferred to the Victoria Hospital Unit as well as all those from Westminster Hospital (D.V.A.).

I would feel quite strongly that the extent to which some of these services legitimately might be located in other than teaching centres, is very small. There are a number of reasons for this statement. The Canadian Neurological Association in its Manpower Survey has come up with the recommendation that there should be about four or five neurosurgeons per million of population. No longer can neurosurgery be thought of as a man trained in the specialty, practising on his own. The modern Neurosurgical Unit demands a co-ordinated team for investigations and treatment, let alone teaching and research, of highly trained and skilled people. To this must be added the enormous cost of establishing the physical facility.

You may be aware of what has happened in the United States where large numbers of neurosurgeons have been trained and dispersed throughout the country, there being as many as four or five in a small town. At the time a legitimate demand for their services appeared to be the care of the head and spine injured patient. What has happened of course, is that the majority do very little surgery, spending their time and earning their living doing neurology, special investigations (angiography and myelography etc.) and operating on trauma and the odd tumor or aneurysm that may come along. This diversification of effort is not only costly, but has altered the quality of neurosurgical care.

In view of the possibility of modern transport systems, there seems little reason to promote such diversification and its results in Canada. I would like to speak as strongly as I can about your proposal to develop transport facilities for transfer of patients quickly from the periphery to the University Centres offering specialized services. Thereafter, the only concern would remain trauma. The Canadian Neurological Society has taken the view that rather than train a vast number of neurosurgeons to spread all over the country for trauma, it would be best to see that our young general surgeons in training have some instruction and practice in the emergency care of trauma to the central nervous system. This would allow the young men trained in neurosurgery to be concentrated in the regional centres across the province where they would have their greatest chance to be productive in all aspects of neurosurgery.

You may be interested to learn that a whole floor of the new University Hospital is being devoted to Medical and Surgical Neurology. In anticipation of this, a new department has been formed at the University of Western Ontario, The Department of

Clinical Neurological Sciences, comprised of a Division of Neurology and a Division of Neurosurgery, with numerous cross-appointments with the other disciplines of Medicine and the Basic Sciences. It is envisaged that the major units for Neurology and Neurosurgery will be centered at the University Hospital after 1971. Some "General Practice" will continue to be done at St. Joseph's Hospital. The unit at Victoria will remain viable, simply because of case-load, trauma, the cancer institute and the proposed new Children's Hospital nearby.

**Extracts from a report by Dr. D. A. Rosen to the
Sub-committee on Highly Specialized Services, May 1969.**

Location of Highly Specialized Supporting Services

University and Hospital	Neuroradiology	Neuropathology	Echo-encephalography	Electro-encephalography	Diagnostic Clinical Neurophysiology	Brain Scanning	Neurochemistry
McMaster Hamilton General St. Joseph's	X X	X	X X	X -	*	*	-
Ottawa Ottawa Civic Ottawa General	X X	X X	- -	X X	X -	*	-
Queen's Kingston General Hotel Dieu	X -	* -	X -	X X	X -	X -	- -
Toronto Toronto General Toronto Western Hosp. for Sick Children St. Michael's	X X X X	X X X -	X - - -	X X X -	X - X X	* -	X - X -
Western Victoria Children's Psychiatric Research Unit	X -	- -	- -	X -	- -	* -	- X

Note: Not all questions were answered by each correspondent, thus the data given may be incomplete.

* Specific hospital not stated.

Conclusions

1. Neurologists and neurosurgeons provide Highly Specialized Services and, to function most advantageously, *must* have available *as a minimum* the ancillary Highly Specialized Services of neuro-radiology, echoencephalography, electro-encephalography. Other services and relationships, particularly neuropathology, are essential to neurological and neurosurgical care at a high level. Thus, neurology and neurosurgery should be located only in communities in which medical schools are situated.
2. Neurology and neurosurgery are essential components of academic university medicine. All university centres in Ontario *must* have these disciplines. They should, however, be situated in *some* and *not necessarily all* affiliated teaching hospitals of Ontario Faculties of Medicine. Other hospitals in university and other centres should have ready access to consulting services.
3. Neurology and neurosurgery are interdependent and must not be individually isolated in any hospital.
4. Traumatic neurosurgery in other than university centres should fall within the skills of locally available surgical and medical personnel.
5. Among the Highly Specialized Services listed, neuropathology and diagnostic clinical neurophysiology may be located in some, but not necessarily all of the institutions with functioning neurological and neurosurgical units.

Transportation

Highway transport of patients by ambulance is, for the most part, adequate in Southern Ontario. Transfer from more remote areas should, where needed, be by air (including helicopter). Improved communication from ambulance personnel and police would help to overcome undesirable delays in urgent management by bypassing nearby community hospitals in instances of severe craniocerebral trauma.

SECTION IV

Otolaryngology

Extracts from a report by Dr. D. A. Rosen to
the Sub-committee on Highly Specialized Services,
May 1969.

Comments and Recommendations

1. Highly Specialized Services in this field include advanced and objective audiometry, specialized vestibular studies (including electronystagmography), speech therapy, and therapeutic ultrasonics.
2. Subjective audiometry and microsurgery have become part of the armamentarium of the modern otolaryngologist and should be available in all hospitals in which such professional skills are available.
3. The defined Highly Specialized Services should be represented in some (not all) affiliated teaching hospitals of Ontario Faculties of Medicine and to some extent in specific institutions such as the Ontario School for the Deaf.
4. Specialized otolaryngological pathology should be centered in no more than one appropriately staffed affiliated teaching hospital or laboratory of Ontario Faculties of Medicine.

Location of Highly Specialized
Supporting Services

University and Hospital	Subjective Audiology	Cortical Audiometry	Speech Therapy	Vestibular Function Investigations (Electronystamography)	Therapeutic Ultrasonics
McMaster	—	—	—	—	—
Ottawa					
Ottawa Civic	—	—	X	—	—
Queen's					
Kingston General	X	—	X	—	—
Toronto				+	
Toronto General	X	—	X	X	—
Toronto Western	—	—	X		—
Hospital for Sick Children	X	X	X		—
St. Michael's	X	—	X	X	—
Sunnybrook	X	X	X	X	X
Wellesley and others	—	—	X	—	—
Western					
Victoria	X	—	X	X	—
Children's Psychiatric Research Unit	X	X	—	—	—
Crippled Children's Trt. Centre	—	—	X	—	—
St. Joseph's	X	—	—	—	—
Westminster	—	—	X	—	—

+ Specific Hospital not stated.

Transportation

Otolaryngology has no *specific* transportation requirements. There is a real problem in the geographic distribution of otolaryngologists. Mobile clinics with limited facilities but which are adequate for case finding should be encouraged.

Extracts from a letter from Dr. F. J. Rounthwaite,
Professor and Head, Department of Otolaryngology,
University of Western Ontario, London, Ontario,
to Dr. D. A. Rosen, May 6, 1969.

In the Department of Otology, Rhinology and Laryngology, our discussion as to the highly specialized medical services in this area are as follows:

Ear

The diagnosis and measurement of deafness in children: This is a most important area that can only be properly carried out at the Regional Centre because of the complexity of equipment and the staff necessary to provide this service. We have full Audiology Units with the very latest equipment at both Victoria and St. Joseph's Hospital, with the one at St. Joseph's having a special interest in children because of the talents of the Audiologist. There is also an extensive diagnostic unit at the Children's Psychiatric Research Institute designed specifically for the evaluation of hearing in children with a mental age beneath five years. This includes a cortical audiometry unit which has now been in operation for three years and is the only practical method of objective measurement of hearing in use today.

The diagnosis of deafness in adults, especially retrocochlear lesions: This unit (a Bekesy audiometer) is placed in Victoria Hospital which is the primary centre for the treatment of tumours in the Neurosurgery Department in London.

Vestibular diagnostic services: A unit capable of electronystagmography is adjacent to the Audiology Department at Victoria Hospital. It was placed there again because of the importance of this service in Neurosurgery and Neurological diagnosis. It is operated by Dr. David Smith who has recently completed a year of post-graduate

training with Dr. Hugh Barber and Dr. Joseph Farkashidy in Toronto.

Microsurgical facilities: Surgery through the operating microscope has become a routine procedure in Otolaryngological practice. However, the approach to the internal auditory meatus via the labyrinth or the middle cranial fossa is of sufficient complexity that it is only likely and probably should only be done in the Regional Centre.

Larynx

The radiotherapeutic treatment of cancers of all types is centered on the Ontario Cancer Foundation, London Clinic attached to Victoria Hospital. This Department is equipped with two or more Cobalt therapy units, a Betatron, hyperbaric oxygen facilities and extensive personnel expert in chemotherapy and the use of isotopes.

Surgically, while total laryngectomy with or without neck dissection is a procedure that should be carried out by all Fellowship calibre Otolaryngologists the post-operative care with the best intensive care units can only be found in an area with a large experienced resident training programme both in Otolaryngology, Anaesthesia, General surgery, Medicine, etc.

Nose

All nasal surgical procedures might well be done in large community hospitals but such things as the transnasal approach to the pituitary, extensive repair procedures for cleft palate etc., require associated services and clinics, not likely to be available in smaller centres.

Endoscopy

Particularly more difficult foreign bodies tend to gravitate to a Regional Centre. The complexity and diverse nature of instrumentation, that is required to be able to handle all and any foreign body, is beyond the capacity of the average small hospital.

Area Population Served

The London Regional Centre tends to routinely service an area from Chatham and Sarnia on the west, to Wingham, Tobermory and the Bruce Peninsula on the north and thence down through Kitchener to

Simcoe. The area to the southeast of this is centred in Hamilton, and the area to the east and northeast from Toronto. A small island exists around Windsor using Detroit for its particularly sophisticated facilities but an occasional patient from this area is referred to London.

An institution such as the Children's Psychiatric Research Institute in London which has its purpose in the diagnosis, treatment and the carrying out of research in retardation, through its fame elsewhere, has tended to draw from well outside its area and it is the particular needs of the patient clientele such as attends the C.P.R.I. that brought about the development of the cortical audiometry unit at that institution.

Since Southwestern Ontario is a fairly densely populated area with numerous small cities, a rough estimate of the population reached for special referral purposes is in the range of 1,500,000. The Cancer Clinic finds it expedient to run satellite follow-up clinics in Chatham, Sarnia, Wingham, Stratford, Kitchener and possibly others and a similar arrangement undoubtedly will become necessary when an area of Speech and Hearing Diagnostic and Treatment Unit is established in London, hopefully in the next couple of years.

Travel Requirements

There does not seem to be a great need for air transportation in Southwestern Ontario. The road system is so good that there is rarely any significant difficulty in transporting a patient to London who is not so ill that any travel would be harmful. The addition of an air service with the time taken to transport the patient to the plane and from the airport to the hospital acts very strongly to nullify the benefit of speedy air transportation. In weather sufficiently bad to interfere with road transport, there is usually also a stoppage of air transport as well.

Location of Services

There is a grave danger and in fact it has already happened in some cases that smaller centres may persuade their hospital authorities to purchase ultra expensive special diagnostic equipment because other people are doing so. In Southwestern Ontario, already on occasion, this equipment has been bought and remained idle because the proper physicians and technical people to operate it were not themselves available. From the mere point of view of economy it

makes sense to concentrate special equipment in Regional Centres and to develop satellite follow-up clinics in the non-teaching areas similar to the system that has worked so effectively for the Cancer Treatment Unit.

It should also be recognized that Otolaryngologists are in short supply. There are openings for probably a dozen certified men in the area covered by London and its region and no real indication of interest in these jobs. We ourselves in London with the University Hospital, expected to be opened in 1972, will have openings for probably another six Otolaryngologists since the present practising and teaching group is almost all over 40 and our new replacements are just beginning to come on the scene.

SECTION V

Ophthalmology

Extracts from a report by Dr. D. A. Rosen to
the Sub-committee on Highly Specialized Services,
May 1969.

Recommendations

1. The following “Highly Specialized Services” should be represented in some (not all) affiliated teaching hospitals of Ontario Faculties of Medicine *and* in selected non-university regional centres:

- Orthoptics.
- Glaucoma laboratory and associated visual field analysis.

2. The following “Highly Specialized Services” should be represented in some (not all) affiliated teaching hospitals of Ontario Faculties of Medicine:

- Retinal photography including angiography
- Retinal photocoagulation
- Contact lens clinic

3. The following “Highly Specialized Services” should be situated in *one* affiliated teaching hospital or laboratory of Ontario Faculties of Medicine if adequate local interest or resources are present:

- Ophthalmic Pathology

Location of Highly Specialized
Supporting Services

University and Hospital	Glaucoma Clinic and Specialized Visual Fields	Orthoptics	Retinal Photography including Angiography	Ophthalmic Pathology	Radio-Isotope Studies	Medical Genetics	Electroretinography	Electro-oculography	Retinal Photocoagulation
McMaster									
St. Joseph's	X	—	—	—	—	—	—	—	X
Ottawa									
Ottawa Civic	X	X	X	X	—	—	—	—	X
Ottawa General	X	—	X	X	—	—	—	—	X
Queen's	+		+	+			*	*	
Kingston General		X			—	—			X
Hotel Dieu		—			—	—			—
Toronto				+		+	+	+	
Toronto General	X	X	X		X		X		X
Toronto Western	X	—	X		—				X
Hospital for Sick Children	—	X	—		—	X			
St. Michael's	X	—	X		—				X
Sunnybrook	X	—	X		—				
Western									
Victoria	X	—	X	X	—	—	—	—	X
St. Joseph's	—	—	—	X	—	—	—	—	—

* Planned for early introduction

+ Specific hospital not stated

Location of Highly Specialized
Supporting Services

University and Hospital	Electromyography	Ultrasonography	Contact Lens	Low Vision Aids	Dark Adaptometry	Specialized Color Vision Testing	Aniseikonia Testing	Diagnostic Microbiology	Eye Bank Laboratories
McMaster St. Joseph's	—	—	—	—	—	—	—	—	—
Ottawa Ottawa Civic Ottawa General	— —	— —	— —	— —	— —	— —	— —	— —	— —
Queen's Kingston General Hotel Dieu	 — —	* 	 — X	 — *	 — —	 — —	 — —	 — *	 — —
Toronto Toronto General Toronto Western Hospital for Sick Children St. Michael's Sunnybrook	+ 	 — — — X —	 — X — — —	 — X — — —	+ 	 X — — — —	 X — — — —	 — — X — —	+
Western Victoria St. Joseph's	 — —	 — —	 — —	 — —	 — —	 — —	 — —	 — —	 — —

* Planned for early introduction

+ Specific hospital not stated

- Diagnostic Microbiology
- Electroretinography
- Electro-oculography
- Ultrasonography
- Low vision aid clinic

4. The following “Highly Specialized Services” should be situated in *one* affiliated teaching hospital or laboratory of an Ontario Faculty of Medicine:

- Eye Bank Laboratory
- Electromyography
- Radio-Isotope studies
- Medical Genetics (Ophthalmic) and karyotyping
- Dark Adaptometry
- Specialized color vision testing
- Aniseikonia testing

Transportation

While ophthalmology has no *specific* transportation requirements, efficient methods of transport would facilitate care of true emergencies in remote areas and would make available highly specialized diagnostic and therapeutic services to populations not adequately served at present.

SECTION VI

Paraplegic Units

Extracts from a Report by Dr. W. F. Lumsden to
the Sub-committee on Highly Specialized Services,
May 22, 1969.

Introduction

This short report will be divided into three main sections:

- I Background Information
- II The Present Situation
- III Plans for future Developments

I BACKGROUND INFORMATION

Specialized paraplegic units have been developed in many countries throughout the world. In some areas they are free-standing institutions; in others they are a part of rehabilitation centres or even general hospitals. There is still some difference of opinion among the experts in the field as to which approach is the most desirable. It seems likely, however, that any one of the three approaches can work very well provided the proper facilities and personnel are available.

a. **Types of Cases Treated**

The majority of cases treated at these units suffer from spinal cord injuries resulting in paraplegia or quadriplegia. A few other types of cases are handled such as multiple sclerosis, muscular dystrophy, poliomyelitis, and the sequelae of head injuries.

Spinal injuries resulting in paraplegia form the largest single group. There are slightly over twice as many cases of paraplegia as quadriplegia. However, the quadriplegics require twice the length of time in hospital for proper treatment and, because of this, the hospital population at Lyndhurst Lodge, for example, is now about 50 per cent quadriplegics, 50 per cent paraplegics, with the occasional patient suffering from some other condition.

b. **Etiology**

The leading cause of spinal cord injury resulting in paraplegia or quadriplegia is now automobile accidents. The total number of cases increases each year. The number of problems arising from head injuries with severe brain damage is increasing.

c. **Caseload**

It is very difficult to determine the number of new cases to be expected each year. The Swiss state that they expect to treat ten new cases per million population per year. In the United States, some reports state that as many as fifty new cases per million population can be expected annually. In Ontario, the Ontario Hospital Services Commission statistics at the present time show only broad classifications of disease, so that the numbers of cases of paraplegia and quadriplegia admitted to our hospitals each year is not available. Next year our coding will be done on a different basis so that individual disease and injury will be coded separately, so that we will be able to determine the number of any particular type of case discharged from hospital each year.

There is now a waiting list of 35 patients for admission to Lyndhurst Lodge, and one or two of these patients have been on the list for nearly a year.

d. **Need for Specialized Units**

The requirement for a specialized unit to handle paraplegic and

quadriplegic cases is brought about by the following:

1. A special facility with special equipment is required because of the need to:
 - i Care for patients with gross paralysis.
 - ii Retrain severely paralyzed patients in the activities of daily living.
 - iii Retrain severely paralyzed patients in the hope of producing at least some economic self-sufficiency.
2. Specially trained personnel in several medical and para-medical disciplines are required in handling the complex problems of the severely disabled paraplegic and quadriplegic patients. The list of personnel includes neuro-surgeons, orthopaedic surgeons, plastic surgeons, urologists, specially trained nurses, physiotherapists, occupational therapists, psychologists, social workers, and teachers of various types. All of these do not have to be on site, but should be readily available for consultation. It is also extremely important that the treatment team be well motivated. All of the severely disabled patients face severe psychological problems in adjusting to their disability and incapacity, and the manner in which they are handled is at times just as important as the methods of treatment employed.

II PRESENT SITUATION

a. Lyndhurst Lodge

Lyndhurst Lodge, located in Toronto, is at present the only specialized unit for the treatment of paraplegic and quadriplegic patients in Toronto. The bed capacity of this institution is 52 beds. As noted previously, the waiting list is 35. In its early years, Lyndhurst received patients from many provinces of Canada, but due to the development of facilities in other areas of the country, 99 per cent of the patients treated in this institution are now Ontario residents. The average length of stay for patients in Lyndhurst Lodge is just over six months. In 1968 the average length of stay for patients with complete quadriplegia was 10.89 months; whereas, the length of stay for those with complete paraplegia was 4.96 months.

b. Regional Rehabilitation Centres

Regional Rehabilitation Centres are developing in each of the regional centres in Ontario. These centres are located in Southern Ontario at the University Medical Schools, and in Northern Ontario at Sudbury and the Lakehead. No separate paraplegic unit exists at any of these centres, but some of the Regional Rehabilitation Centres now do handle some cases of paraplegia and quadriplegia. This is particularly true in London, Hamilton, and Kingston, where facilities and specially trained staff are now available. This is a recent development, and the number of cases treated so far is insufficient to give any indication of probable future case load.

c. General Hospitals

Cases in the acute phase immediately following injury are often admitted to the acute care wards of general hospitals. Frequently, the initial phase of treatment is completed at this institution and transfer to Lyndhurst Lodge or one of the Regional Rehabilitation Centres is arranged when a bed becomes available.

III PLANS FOR FUTURE DEVELOPMENT

a. Lyndhurst Lodge has approval to build a new hospital with a capacity of 104 beds—double its present capacity.

b. Regional Centres

As the caseload increases, it is planned to develop units of 20 beds within the Regional Rehabilitation Centres. A smaller unit is uneconomical to staff, and it would be difficult to attract and hold specially trained staff to look after fewer than 20 patients. Therefore, until specialized units of this size can be justified, the Rehabilitation Centres should continue to look after these patients within their general rehabilitation beds.

SECTION VII

Burns Units

**Extracts from the Draft Report of the
Committee Established to Study Need for
Specialized Burn Units in Metropolitan Toronto
June 1969.**

I COMMITTEE MEMBERSHIP

Dr. W. R. N. Lindsay (Chairman)
Dr. W. D. Butt
Dr. A. W. Farmer
Dr. E. P. McDougall

II SUMMARY OF FINDINGS

1. Definition of a Burn Unit

A burn unit is a unit set aside for the treatment of burns. This unit is generally associated with a plastic surgery department and, in addition to caring for patients with burns, conducts research into their treatment.

2. Criteria for Admission to a Burn Unit

Patients requiring admission to a burn unit would probably have:

- a. 2nd or 3rd degree burns;
- b. adults—10 per cent or more of body involved, children—7 per cent or more of body involved.

3. Requirements for Burns Units

- a. Hospitals developing these units should have an active plastic surgery department and at least two plastic surgeons on the active staff. Adequate nursing staff must also be available.
- b. Burn units should function on a regional basis, that is as the referral centre for severe burns in their geographic district. Location and organization of the unit can probably be best determined by the hospital and medical personnel within each health care planning district.

4. Role of the Hospital Without Formal Burn Unit

Hospitals without formal burn units will treat patients with minor burns, and will arrange to transfer patients with more severe burns to a hospital with a specialized burn unit.

5. Personnel

- a. **Surgical** — at least two qualified plastic surgeons. A system of medical cross-appointments should be developed.
- b. **Nursing** — adequate nursing personnel with specialized training in emergency, operating and recovery rooms must be provided. The staffing pattern will probably be comparable to that required for staffing intensive care units.

6. Physical Requirements

The basic physical components of a burn unit should include:

- a. isolation facilities. Location of choice would be adjacent to intensive care unit.
- b. ten beds which might be arranged as follows:
 - 2 single rooms
 - 4 two-bedded rooms
 - each room with private lavatory.

- c. adequate service area, including:
 - nurses station
 - drug storage and preparation area
 - clean and dirty utility rooms
 - dressing room with burn bath
 - storage areas—supplies (dressings, etc.)—equipment
 - operating room (suitable for general anaesthesia)
 - doctor's office
 - pantry
 - refrigeration for blood, drugs, etc.
- d. air conditioning with positive pressure.
- e. odour control console.
- f. multi-purpose room—for physiotherapy, OT, lectures, etc.
- g. space for small laboratory.

Special Equipment:

- i weighing equipment.
- ii crane—for lifting patients.
- iii circle electric beds.

It is recognized that there are many design modifications which can be made to a burn unit.

SECTION VIII

Rheumatic Disease Units

Extracts from a letter from
Dr. John S. Crawford, F.R.C.P.(C), Internal and
Rehabilitation Medicine, Toronto, Ontario, to
Dr. I. M. Hilliard, July 15, 1969.

In the early 1950's, physicians responsible for the care of rheumatic disease patients recognized the central importance of Rheumatic Disease Units. Such units had been notably successful in Britain and Scandinavia. Partly as the result of their experience with Rheumatic Disease Units established in Department of Veteran's Affairs Hospitals, these physicians and the Canadian Arthritis and Rheumatism Society's Medical Advisors were convinced that such Units would demonstrate exemplary standards of diagnosis and treatment and make significant contributions to clinical research, undergraduate, graduate, and continuing medical education. It was expected they would exercise their profound and beneficial influence on standards of care for the arthritic patients far beyond the confines of these Units.

The design of each Rheumatic Disease Unit must vary in accordance with the situation to be found in a particular academic, medical, and hospital setting in which it is located. An optimum unit size is visualized as a complex of 30 to 40 beds segregated for the care of arthritic patients combined with associated research and teaching space, directed by the staff of rheumatologists and other specialists all located in a teaching hospital.

The shortage of beds at teaching hospitals, the shortage of staff combined with the massive cost of hospital care, delayed the implementation of this programme. The advent of government sponsored hospital insurance went far towards overcoming the main financial obstacle.

Opening Situation

The Canadian Sickness Survey published in 1951 adjusted to findings of the 1961 census shows that approximately 114,000 Ontario residents are disabled to some degree by rheumatic diseases. Approximately 25,000 are totally or severely disabled.

The widespread application of measures of treatment known to medical science would significantly reduce the extent and degree of disability due to arthritis and other rheumatic diseases. Further, there were sound grounds for the belief that expanded medical research would produce increased knowledge of these diseases and their treatment looking ultimately towards their prevention and cure.

Development of Rheumatic Disease Units in Ontario

Early in 1960, the first Rheumatic Disease Unit was established at Queen Elizabeth Hospital. It consisted of some 20 beds under the direction of Professor Wallace Graham through the Faculty of Medicine of the University of Toronto. Financial support to raise salaries of professional, medical and paramedical staff, and secretarial staff are supplied by the Canadian Arthritis and Rheumatism Society. As the Unit grew, it was necessary to enlarge operations and the Unit was moved to Sunnybrook Hospital with increased bed space, increased scope for development of research, teaching about medical and paramedical personnel and individual and group care.

Close co-operation was maintained between the Unit staff and the home visiting physiotherapist of the Canadian Arthritis and Rheumatism Society to ensure continuing treatment. At the same time, detailed care and instructions concerning the patient were sent to the referring doctor.

University of Toronto Rheumatic Disease Unit Five-Year Report, 1960 to 1965

As has been noted in previous years, it is the exception to be able to alter significantly the stage to which rheumatoid arthritis has

progressed by any form of therapy. Except for the earliest stage of the disease, Class I, the anatomical damage to the joints caused by rheumatoid arthritis is of a permanent nature. Improvement in response to treatment, however, is dramatically apparent in the improvement of the functional capacity of the patient in relation to the articular damage which exists, and the therapeutic measures are, therefore, designed to attain this objective. Thus, a patient in Class II, capable of complete self-care but handicapped in regard to full occupational activity, may be restored to Class I and full occupational capacity with but minor discomfort. Similarly, a patient with very little occupational capacity and self-care, Class III, may be upgraded to Class II or even Class I after a period of treatment. Patients who are wholly incapacitated (Class IV, confined to bed or a wheelchair and requiring the assistance of an attendant) may often be improved to a higher classification and be rendered capable of complete self-care or (rarely) attain limited occupational capacity thereby relieving the community or the family of the need to provide constant nursing care or assistance.

Assessment of functional capacity in 243 patients with rheumatoid arthritis at the time of admission to the Unit and at the time of discharge, revealed a substantial reduction in the proportion of patients in Class III and Class IV, 42 per cent and 73 per cent respectively at the time of discharge from the Unit. The majority of these were rendered capable of relatively normal activities and many were capable of returning to part time or full time employment. It is the exception for a patient to fail to notice some benefit from a period of treatment in the Unit. The relapse rate would appear at the order of about 25 per cent, many of whom require re-admission at a later date. In a large measure, this good record is related to the follow-up physiotherapy programme of self-care, daily exercise, appropriate drug therapy, and early recognition of exacerbation of the disease.

Conclusion: The experience fully justified the Unit programme over the five-year period without which most of these patients would be destined to progressively increasing disability and dependence.

Existing Rheumatic Disease Units

At the present time, Rheumatic Disease Units are developing satisfactorily in London, Hamilton, two in Toronto, and one in Kingston. The establishment of Rheumatic Disease Units depends upon the co-operation among the Universities, and the hospitals

concerned, Hospital Services Commissions, and the Canadian Arthritis and Rheumatism Society.

Role of the Canadian Arthritis and Rheumatism Society

The Canadian Arthritis and Rheumatism Society was incorporated on March 15, 1943, with the prime purpose of controlling and conquering arthritis and other rheumatic diseases. Over the years, it has steadily grown with revenues now exceeding two million dollars annually, primarily because it has sought to act more as a promoter than a purveyor of services. Thus many millions of dollars of governmental funds are being directed against arthritis each year through Provincial Hospital Insurance schemes, the Department of National Health and Welfare, and the Medical Research Council of Canada.

Its objectives are: 1) To increase the staff of physicians trained in the care of rheumatic diseases; 2) To foster rheumatic disease research; 3) The establishment of Rheumatic Disease Units and Arthritis Clinics; 4) The development of sufficient resources for physiotherapy and other paramedical services. These services are essential for the prevention or correction of disability due to arthritis. In 1948, many hospitals could not provide for out-patients, particularly those suffering from long term and potentially disabling conditions. Physiotherapy was not available for those who needed to be treated in their homes.

Several other programmes including the provision of Fellowships for the training of teachers of physiotherapy, the Society has played a significant role in the development of physiotherapy schools. The provision of Hospital Out-Patient Services has progressed to the point that physiotherapy is now paid for by the government.

During the early period in many communities, the Society found it necessary to establish its own physiotherapy treatment centres. It has now been able to close but a few of these in communities where special circumstances prevail. The need for home physiotherapy services of the Society has not diminished, however, and this is equally true of the related services of occupational therapists and social workers. This remained the Society's main direct patient care services furnished by its professional staff, who provided treatment and consultation to more than 12,000 patients in Ontario last year.

Need For the Future

More specialists trained in the care of rheumatic diseases are needed and the supply is unlikely to meet the demand for some time to come.

Insufficient support for medical research poses the greatest threat to the immediate and ultimate success of the Society's endeavours. Rather it should be seen as a clear and present danger to the entire fabric of medical education in Canada. The Society must play its part not only in furnishing funds for research in its own field but also by pursuing interpretation of the nature and gravity of the problem in its widest sense.

Further development of Rheumatic Disease Units in teaching hospitals is essential to enable research both of the clinical and basic level to be undertaken. It is important to establish further Rheumatic Disease Units to expose the undergraduate and graduate students to the problem of treatment and research in rheumatic diseases.

At present there are 136 beds available in the Rheumatic Disease Units in Ontario. For optimum care of rheumatic patients, the desired number of beds in Ontario would be .05 beds per 1,000 population or 1 bed per 20,000 population. Considering Ontario to have seven million people, the desired number of beds would be 350.

Hospitals next scheduled for consideration of Rheumatic Disease Units in Ontario are The Ottawa General, and when available, The New Mount Sinai, which would serve as a base for the Toronto Hospitals, such as, St. Michael's, Toronto General, Women's College, and The Mount Sinai.

**Preliminary Report by Dr. W. F. Lumsden to the
Sub-committee on Highly Specialized Services,
June 1969.**

Rheumatic Disease Units:

Purpose

Special units for Rheumatic Disease are required for:

1. Research—basic and clinical.
2. Educational activities designed to improve the training of doctors and other health workers in the arthritis field.
3. The establishment of improved standards of medical care.
4. The development of more specialists in rheumatology.

Location

The main objectives of the units dictate that the highly specialized units be located in teaching hospitals at medical schools. They should be part of general hospitals, not separated.

Size

Most authorities in the field recommend a unit of 30 to 40 beds, with 40 being the maximum.

Physical Facilities

First rate physiotherapy and occupational therapy departments and a therapy pool are essential. It is desirable to have a group exercise area and occupational therapy on the ward as well. Conference room and social service area with provision for private interviews are required.

Staff

1. Rheumatologist—medical specialist who should direct the unit.
2. Surgeon—trained in orthopaedics and with a special interest in arthritis.
3. Specially trained nurses.
4. Occupational therapists.
5. Physiotherapists.
6. Social service worker.
7. Other specialists, when required (psychologist, psychiatrist, physiatrists and other medical specialists).

Value

The following extract from the 1965 Annual Report of the Canadian Arthritis and Rheumatism Society illustrates the value of these specialized units:

The University of Toronto Rheumatic Disease Unit has been in existence for nearly six years and thus it is the oldest Unit in Canada. Academically a sub-unit of that University's Department of Medicine, it now has divisions located at the Toronto General Hospital and at Sunnybrook Hospital. A major new division soon will be established at the Wellesley Hospital.

Four important observations may be made on a recently published report of the first five years of the Unit's existence:

- 1. Of the 243 patients with rheumatoid arthritis who were treated and discharged: at the time they entered the Unit, 71 were gravely incapacitated (confined to bed or wheelchair), 133 were seriously limited in function and 39 were slightly limited. At discharge from the Unit only 19 patients remained gravely incapacitated, 77 had serious limitations, while 147 had minor limitations, or none at all. Equally encouraging results were achieved among the 515 patients treated suffering from other rheumatic diseases.*
- 2. A follow-up study, initiated in 1962, indicated that this improvement is maintained for long periods. Only about 25 per cent of patients relapse, many of these being re-admitted to the Unit.*
- 3. A significant contribution was made toward the attainment of Objective 1 (increasing the stock of rheumatologists) in that 15 fellows received one or more years graduate training.*
- 4. Resulting from research projects conducted in conjunction with the treatment programme, 24 papers were published in national and international scientific journals.*

Acceptance and approval of the Rheumatic Disease Unit concept is confirmed by the fact that of 758 patients admitted to the University of Toronto Unit in its first five years of operation, 415 were admitted in the first four years, 343 in the fifth year.

There was a substantial decrease in the duration of hospital days per admission, from 68 days in the first year, to 44 days in the fifth year.

Without the Unit's special facilities for assessment, diagnosis, treatment and rehabilitation most of these patients would have been destined to progressively increasing disability and dependency.

Present Situation

1. **Canada** — There are Rheumatic Disease Units at 7 Canadian medical schools.
2. **Ontario** — Units exist at:
 - (a) University of Toronto — Sunnybrook Hospital
Toronto General Hospital
Wellesley Hospital
 - (b) McMaster University, Hamilton —
Hamilton Health Association
 - (c) University of Western Ontario —
Westminster Hospital will be transferred to University Hospital when this hospital is completed.

Units also exist in Toronto at the Orthopaedic and Arthritic Hospital, and the Toronto East General Hospital. These units are not engaged in undergraduate medical education.

Future Requirements

The Canadian Arthritis and Rheumatism Society plans to support the development of new units in five additional medical schools in the next few years.

In Ontario, units are planned for Queen's University, Kingston, and the University of Ottawa.

No estimates of total bed requirements exist in Ontario at this time. Much depends on how the total programme for the care of the arthritic patient develops. It seems likely that as more rheumatologists are trained in the specialized units, more patients will be adequately cared for by these specialists in general hospitals on general medical wards. This will, to some degree, affect the

requirement for beds in the special units. The extent to which this will affect requirements, however, is not known, and periodic review of developments will be required.

In 1965, a Scandinavian Committee recommended a minimum of 200 beds per million inhabitants be provided in rheumatism units. This would include beds in regional teaching hospitals, and also in “central” non-teaching hospitals. These latter are planned as treatment units linked with the medical department, and apparently are not involved in research or medical education.

Using this standard, and an estimated population of 7.3 million, Ontario needs 1,460 beds in rheumatic units. At present we have about 280 beds in regional centres, with another 80 planned for the near future. Unless more regional units are developed, we need about 1,100 beds in other general hospitals. These are now provided within the general medical beds, not in separate units.

One further requirement is the development of a paediatric unit. None exists now, although one specific paediatrician does see all cases of arthritis at the Hospital for Sick Children in Toronto.

Summary

In a general way, a Rheumatic Disease Unit is visualized as a complex of 30 to 40 beds segregated for the care of arthritic patients combined with associated research and teaching space, directed by a competent staff of rheumatologists and other specialists, all located in a teaching hospital.

It is expected that these units will exercise a beneficial influence on standards of care for the arthritic patient far beyond the immediate bounds of these units.

The exact number of units and the total number of beds required in Ontario are not known. Availability of trained staff could slow development of units.

Recommendations

It is recommended that:

1. Rheumatic Disease Units be developed in each of the medical schools of Ontario.

2. Further investigation of the number of units, number of beds, and staff required, be carried out.

SECTION IX

Clinical Investigation Units

Extracts from a letter from Dr. R. W. Gunton to
Dr. I. M. Hilliard, April 8, 1969.

It does appear that all of the responders are in general agreement with the functions of a clinical investigation unit defined in my review. Some lesser alternatives are proposed as in the submission from Dr. Valberg of Kingston, of Dr. Goldberg of Hamilton and of Dr. Smiley of Ottawa. There is a clear consensus that a facility of this type is required in each hospital associated with a university. The position is not quite so clear in respect to major community hospitals without university affiliation, although almost all the responders agreed that an area should be provided where special diagnostic facilities could be adequately carried out for patients with certain problems.

The matter of relative cost is dealt with by a number of the responders. If one removes from consideration the laboratory backup required of a clinical investigation unit, the cost in terms of additional rooms, staff and special facilities would not appear to be greatly in excess of that for ordinary ward care. A dietitian and an extra nurse, in those units performing metabolic balance studies, would represent the principle additional personnel requirements.

Extracts from a memorandum from Dr. Leslie Valberg,
Director, Special Investigation Unit, Kingston
General Hospital, Kingston, Ontario, for Dr. R. W. Gunton,
March 20, 1969.

I agree that the terms "Metabolic or Clinical Investigation Unit" connote a restricted area where esoteric investigations are carried out on uncommon diseases. The designation of these units as Special Investigation Units (S.I.U.) would seem to be preferable.

I would agree with the thesis that the purpose of Special Investigation Units should be twofold—firstly, to further the prosecution of that type of research which requires detailed physiological and metabolic observations on patients under controlled conditions; and secondly, to assist with the special diagnostic procedures.

To achieve these objectives it would seem desirable to have two types of investigative unit—1. for the study of patients with endocrinological, metabolic, renal and gastrointestinal disorders that require minimal to moderate care; and 2. for the study of patients with various diseases that require intensive care. The minimal to moderate care unit would be used for metabolic studies involving urine and fecal collections and the careful observation of patients on drug trials. The intensive care unit would be employed for the investigation of patients that require the facilities of an intensive care or coronary care unit. I believe it is important to consider these separately because of differences in facilities, personnel, nursing care and the need for special equipment.

I fully support the idea that the units can serve a very useful function in both the diagnostic workup of appropriate patients and in providing facilities for research. Our Special Investigation Unit has functioned successfully in this way since 1962. Preference is given to the admission of patients on research protocols but when beds are available patients are admitted for diagnostic purposes. Over the last two years approximately 2-4 beds have been employed for all balance studies and the remainder have been used for both diagnostic and research studies involving the collection of blood, urine and stools. The turnover of patients on diagnostic workups has been more rapid than on the general medical ward, their average stay in 1966-67 was only eleven days compared to an average of 13 for the general ward.

While I agree that the nurse to patient ratio need not be inordinately high, I think it should be emphasized that the success of an investigation unit depends on a high standard of nursing care and this cannot be achieved unless the units have excellent nurses and they are fully staffed. It seems to me that the nurse to patient ratio will depend on the type of unit—if it is a minimal to moderate care unit designed solely for diagnostic workup of patients the ratio might be similar to the general medical ward, but if the unit is used for both research and diagnosis the ratio will be higher because of the extra tests and greater sophistication of procedures. In the investigative unit in which patients receive intensive care the nurse to patient ratio will be high because the staff will have the additional duty of carrying out special diagnostic and research investigations on patients who ordinarily require extensive care. In addition to the usual nursing staff these units will need a procedure nurse and one to two extra nursing assistants because of the necessity to exclude orderlies who invariably throw out specimens or spoil investigations.

I am in agreement with the view that the need for special equipment in the minimal to moderate care unit is small but this does not apply to the unit for intensive care patients. Here there may be a need for additional monitors, image intensification, portal EEGs, etc., depending on the type of work that is done.

I believe that the facilities which have been proposed for an investigation unit have been underestimated. In addition to the need for a diet kitchen with adjacent refrigerator in units where balance studies are carried out there is also a need for one to two procedure rooms, an aliquot and storage room for specimens, offices for director, head nurse and secretary, interviewing room, small conference room and a lounge for patients. Laboratories to support the units are not mentioned. If the units are used solely for diagnostic workup of patients then it would seem reasonable to analyze the specimens in the routine laboratories or other special units in the hospital, but if research is carried out then additional laboratories will be required. These may be located in various clinical departments in the hospital or under certain circumstances it may be appropriate to have multipurpose laboratories associated with the unit. For example, certain shared facilities such as blood gas laboratory or an isotope laboratory might be located in the unit.

The Special Investigation Unit should be selfcontained and from an administrative point of view it should be a department in the hospital.

**Extracts from a letter from Dr. R. K. Smiley, Professor
and Head, Department of Medicine, University of Ottawa
Ottawa, Ontario, to Dr. R. W. Gunton, March 18, 1969.**

My comments concerning clinical investigation units are as follows:

1) Functions served. The concept you have outlined is almost identical with one put forward to our local "Teaching Hospital Co-ordinating Committee" by a committee which I chaired. Like you, we have rejected the concept of a metabolic unit *per se*, and recommend a 10 or 12 bed unit, probably administered by a member of the Department of Medicine, but not invariably so, patterned along the lines of the general clinical research centre idea supported by N.I.H.

2) At present, the Ottawa General and Civic each have a facility based on the above idea. The one in my hospital (the General) is 12 beds; the number of beds is adequate, but the physical facilities are grossly inadequate. I believe that such an area does require some adjacent laboratory space as a "special" facility which would not be necessary in conjunction with a similar general ward. Otherwise, the "special" facilities you have mentioned on page 3, are all that is necessary. I assume that a "walk in" cold storage should be on most wards, if not it is essential in relation to this one.

3) Criteria of need: I believe the need for such a unit in a hospital is related mainly to the projected function and staff of the hospital, rather than size. As you have pointed out, it has dual purposes, viz. to provide an essential facility for clinical investigations in many disciplines, and specialized investigative facilities for service purposes. While these overlap, I doubt if there is justification for such a unit unless a considerable number of investigations are anticipated. One can foresee exceptions to the above assumptions, but they would not be common.

I would agree that any major teaching hospital needs such a unit. I realize the definition of "major" may be in question, but this is probably best related to the projected number of staff which will be involved in investigative activity in the institution.

As far as the last question is concerned re relative cost, I have no figures available. The number of nursing personnel is unlikely to exceed the number in a comparable sized general medical ward. More

dietitian's time and effort will be required, and because of the large amount of data collected, a clerk typist is necessary.

**Extracts from a letter from Dr. W. M. Goldberg,
Associate Professor of Medicine, McMaster University
and Head, Department of Medicine, St. Joseph's Hospital
Hamilton, Ontario, to Dr. R. W. Gunton, March 17, 1969.**

In connection with clinical investigation units, I want to point out that I personally have not been involved with these units; therefore, I am speaking only from the practical approach as I see them in both a university affiliated major teaching hospital and probably a large community hospital.

I read your comments that you had submitted which were contained with your questionnaire and I certainly emphasize your point that a metabolic or clinical investigation unit should really be defined in two major ways: one, where it is utilized for investigation of patients in order to arrive at a diagnosis or assess a form of therapy and, secondly, primarily a research clinical investigation unit. I think that the latter unit is different and has functioned far and beyond that of primary clinical diagnosis and evaluation. I feel that the research type of unit should only be in a university hospital and I think there should only be one such unit probably in any region unless the affiliated hospitals with the major university hospital are looking into a particular area in research and in this case I think one could accept the fact there may be multiple such research units. An example of this would be while the university hospital might have a specific area of interest such as renal diseases, and that actually research into electrolyte balance, study of certain physiologic alterations upon renal function, etc., could be carried out on a research level in that particular institution. We do feel, however, very strongly that all such units must be under direct control of the university and certainly their research would have to warrant the need for such a unit.

In regards to the clinical investigation units they are purely for investigation as you have outlined and really are not primary for research. I would think that probably any major university affiliated hospital would require a few beds for this purpose. Again I think that the use has to be carefully outlined and certainly studies that would

be carried out in such beds must be under the control of the individual with a prime interest and skill in that area. I do, however, agree with you that the same two beds for example could be utilized at one time by someone whose interest is primary endocrinology and at another time by someone with a renal interest, etc. This would be really different from the research unit where one group would probably utilize the beds at a given period for probably a fairly prolonged period for a more specific research project.

I would gather from your questionnaire the latter, that is the clinical investigation unit for diagnostic and evaluation purposes, is your major concern at the present time. I would feel that nursing staff for these beds should not be in excess of that used for the general medical ward, however, this staff would have to be particularly trained and instructed in detail as to the exact procedures that would be carried out in these beds. They would have to be familiar with the collection techniques, etc. I personally feel that a committee composed of the members of the medical, surgical, and obstetrical staff that might be using such a unit plus nursing on the unit should be set up with a Chairman and they should have frequent meetings and set standards, regulations, etc., for these particular beds. This committee would also have to probably develop a manual, be responsible for the equipment in such a unit, and have to carry on a continuing programme of education in the use of these beds. I would think such a committee, for example, might consist of an endocrinologist, nephrologist, gastroenterologist, and interested surgeon, and obstetrician, and gynecologist. I would also feel that there could not be two standards of investigation in the given hospital, that is, that certain tests could only be carried out in those beds and not elsewhere in the hospital; this seems as if it might indicate a limitation of privileges, however, everybody in the hospital can't carry out certain radiologic investigations or other detailed investigations, they have to call upon help from the various departments for these tests to be carried out. I see no difference in such a clinical investigation area. For example, I feel that if a physician wanted to investigate a patient for Cushing's syndrome, Addison's disease, etc., that we should automatically refer the patient to the unit who would then carry out the appropriate investigations and the committee member responsible for the area would at least interpret the results for that physician. I know that I am a bit of a heretic in this regard but I feel that the free and easy day of people ordering all sorts of exotic tests, often with little indication and with little knowledge of their results and how to apply them, must be over. The cost of such investigations is too great

and the risk to malinterpretation affecting the patient's well-being is too great to allow this to carry on. By this method I feel that expense and proper utilization could be controlled and what is most important result in clinical improvement.

In regards to your first question I agree as mentioned above with the views that you generally express.

In regards to your second question our hospital had no such area; however, we are just in the process of considering it and I'd like to see it organized in the manner I noted above. We did not feel a few years ago when we started thinking about this that we could satisfactorily fill say two or three beds for such a purpose and organized a team. This team consisted of an endocrinologist and a group of nurses. The endocrinologist with the help of the laboratory and other interested members outlined the criteria for the methods of carrying out certain investigations such as an ACTH test, dexamethazone suppression test, etc., and whenever one of these investigations were ordered the nursing group which had been so instructed, would go to the ward where it was ordered and carry out the following: They first instructed the nurses on the floor as to the collection techniques that were required. Also supplied them with the containers, the proper preservatives and outlined the manner in which the test was to be carried out and also spoke to the patient so-concerned explaining the importance of them collecting the urine, etc. This worked out very well for an interim approach and resulted in, I think, better tests being carried out with more accurate collection, etc. However, it did not affect utilization or proper interpretation as I outlined above and which I feel should be an important part in a clinical investigation unit. I think that I explained above how I think the administrative control should exist in such a unit.

Your question three regarding criteria of need: I would certainly think that every major affiliated teaching hospital should have such a unit and that it should only exist in large community hospitals where such a committee could be set up to organize the unit, control the unit and who would have the ability and training to do so. Therefore, I feel that if a hospital does not have an endocrinologist or a nephrologist it would be unreasonable to consider such a unit. I think that if we can organize regional programmes that regional areas such as in Hamilton two or three of the major hospitals should have such a unit. In the other institutions one could utilize the method that we have tried over the last few years that has worked well, that

is a team that goes to the ward and the patient rather than segregating the beds because I am sure they would not be utilized enough to warrant setting beds aside as we had noted originally. I find it hard to say what size hospital but I certainly think it is not so much the size as the personnel in the hospital that is important in considering having such a unit.

I would think that a very important consideration in this latter area is who are going to carry out the studies on the blood or urine that is collected in such a unit. Because certainly no matter how well you set up the unit if the determinations carried out are not accurate it would be of no value. So I feel that one must have a laboratory representative on any such committee I mentioned above and the laboratory in that hospital must be able to do the tests accurately. I don't think that every hospital, even major hospitals, should be doing all tests as they can't do all tests well. I do feel, however, that blood and urine can be collected properly in any hospital in the region either in such a unit or by a team. It should, however, be regionally organized as to what hospital carries out what tests. There is certainly no problem in transporting blood or urine to the lab that can best do the test. There is rarely any great urgency about having the results of these tests. For example, the patient can be brought in, investigated, discharged, and that all the information compiled after they have even left and correlated with the clinical picture. I would feel that in the region certainly you couldn't expect to have a sub-specialist in every hospital and even in every major hospital and, therefore, I feel there should even be regional consultants for very special investigations. This sounds rather complicated but really it isn't so because the committee within one major hospital could have the unit do the collections and then if there was some difficulty in interpreting them they could approach the regional consultant in the area or group for clarification. This latter would only be necessary in probably a minority of cases and that the local hospital group could probably interpret most of the results accurately.

In regards to your question four as to the relative cost I really have no idea; however, I think the initial equipment wouldn't be great. It might require a bed, weighing scale, refrigerator in the room, etc., but I don't think this would be very much in excess of the ordinary hospital rooms. In regards to the nursing, again I don't think this would be excessive compared to the ordinary hospital bed, it certainly wouldn't be as great as the I.C.U. as you mentioned. I would feel that an educated guess one might require one extra nurse on the floor to supervise in detail such as area and that would be all

the added staff. This particular nurse would only be necessary on probably one shift to correlate everything and she could be the member of the committee and be the liaison between the committee and the rest of the nursing staff on that ward where those beds were located. She could also act as a liaison between the laboratory and the beds to facilitate activities between this unit and the laboratory. You mention the factor of long stay and I don't really think that in the clinical investigation unit for diagnosis and evaluation as you mentioned that there would be a particularly prolonged stay and that most studies could be carried out in five days at the longest. However, certainly in the research type of unit mentioned originally I am sure there would be a very prolonged stay in most instances.

SECTION X

Gastro-intestinal Units

Extracts from a letter from Dr. G. G. Forstner, F.R.C.P. (C)
Assistant Professor, University of Toronto, Toronto, Ontario.
to Dr. I. M. Hilliard, June 24, 1969.

An important distinction must be made between a Community Unit serving the Gastro-intestinal requirements of the immediate population surrounding the hospital, and a Referral Unit organized to deal with the difficult diagnostic and treatment problems passed on by many Community Units.

A Community Unit requires the following facilities:

- a. An intensive care unit capable of serving 5 to 10 patients with acute fluid and electrolyte problems, or gastro-intestinal hemorrhage.
- b. Facilities for the endoscopic investigation of the stomach, rectum and sigmoid.
- c. An associated radiological dept., competent to perform barium examinations of the upper and lower gastro-intestinal tract.
- d. An associated clinical biochemistry dept., capable of performing routine serological and metabolic tests.
- e. An associated surgical and pathological service capable of

diagnosing and treating common malignant problems of the intestinal tract.

Such a unit is capable of serving the majority of gastro-intestinal problems in the community.

A Referral Unit requires the following facilities:

- a. All of the facilities of the Community unit.
- b. Facilities for:
 - 1) Endoscopy.
 - 2) Electrical and motor investigation of esophagus and colon.
 - 3) Liver biopsies.
 - 4) Intubation and biopsy of stomach intestine and colon.
 - 5) Intubation of duodenum and testing of pancreatic secretion.
 - 6) Measurement of gastric acid secretion.
 - 7) Separate specialized biochemical laboratories to service particular requirements of gastric and pancreatic secretory studies, enzymatic activity of intestinal biopsies, as well as to develop tests of special gastrointestinal significance such as the measurement of alkaline phosphatase, isozymes, stool fat, bile salts.

In addition, the Referral Unit should be associated with:

- a. A radiology dept. with the capacity for splanchnic angiography, and cineradiography.
- b. A nuclear medicine dept. with the capacity for performing liver and pancreatic scans.
- c. An associated surgical dept. containing specialists capable of dealing with complex problems such as portal hypertension, post-operative gastric and biliary complications.
- d. Associated back-up facilities provided by nearby referral units servicing other medical sub-specialties.

The aim of such a unit would be to attract a sufficient number of unusual problem cases, so as to acquire maximal experience with their investigation and treatment; to service a centre which would attract students and staff interested in the study of gastro-intestinal disease and finally to provide definitive diagnoses and treatment for problems which demand a concentration of experience and skill.

Facilities Required by Referral Units:

- a. Endoscopy room.
- b. Sigmoidoscopy room.
- c. Intubation room with table and fluoroscope.
- d. Motility laboratory.
- e. Biochemical laboratory.
- f. Separate gastro-intestinal patient ward including:
 - 1) 40 beds—5 overnight investigational beds for ambulatory patients, 5 intensive care beds, reserved for gastro-intestinal problems, 5 metabolic investigation beds for intensive investigation, plus 25 additional investigational and treatment beds.
 - 2) 20 hostel-type beds in the neighbourhood of hospital for ambulatory patients undergoing investigation.
- g. Attached out-patient facilities including 6 to 10 examining rooms.
- h. Attached research laboratories space for special investigators with an interest in gastro-intestinal disease.

Personnel Requirements for a Referral Unit:

- a. Gastroenterologists, minimum of 4, each preferably with special interests, i.e., endoscopy, liver disease, motility, pancreatic disease.
- b. Radiologists, 2 solely responsible for gastro-intestinal investigation.

- c. Pathologists, 1, with primary interest in liver and intestinal pathology.
- d. Biochemist, 1, responsible for development of biochemical assays for the unit.
- e. Surgeons, 4, each specializing in a restricted area of gastro-intestinal surgery, i.e., biliary tract disease, intestinal vascular problems, colon and rectum, etc.
- f. Technical personnel:
 - Endoscopy — 1 nurse.
 - Motility — 1 technician.
 - Intubation — 1 nurse.
 - Biochemistry — 3 technicians.
 - Metabolic Unit — 2 nurses.
 - Intensive Care Unit — 6 nurses.
 - Patient Ward — 10 to 15 nurses.
 - Total 20-25 nurses, 4 technicians.
- g. Residents 2.
- h. Fellows 2 to 4.
- i. Associated investigational and teaching personnel.

Communities Served:

A Community Unit would service the immediate population surrounding the Community Hospital. A ratio of 1 unit to a population of 100,000 seems reasonable.

A Referral Unit would service a much wider area. In Ontario I would anticipate that 6 units, 1 in each of the University Centres with the exception of Toronto which, with its population density, should have 2. This is roughly 1 Referral Unit per population of 500,000.

Re: Gastro-intestinal Units:

Should a Non-University Hospital have a Gastro-intestinal Unit?

The answer is no. To obtain maximum advantages from the Referral Unit it would be advisable to have it associated with other

sub-specialty units and it should have a maximum density of staff. Only the Universities with the primary emphasis on investigation and teaching can attract sufficient staff to service the number of associated Referral Units. In addition, the Referral Unit will be underutilized if it is not available for undergraduate and graduate teaching. The Referral Unit must be motivated by a constant spirit of inquiry in order to deal with complex new problems satisfactorily, and this environment is only likely to be sustained within a University.

Can Facilities be Shared?

Yes, in a limited sense, nuclear medicine, pathology, angiography and biochemical facilities can be shared. However, it is uneconomical and will be inefficient to split the patient ward, intensive care, metabolic investigation, endoscopy, motility and intubation facilities between several hospitals. In fact it is probable now that several hospital groupings could be imagined in Toronto, which in total would have all facilities enumerated, yet the dispersal leads to a total dissipation of effect. It would be far better to concentrate bed facilities in one hospital and to encourage accumulation of staff around these facilities.

SECTION XI

Radiotherapy Units

Extracts from a letter from Dr. T. A. Watson, Director,
Ontario Cancer Foundation, London Clinic, London, Ontario
to Dr. I. M. Hilliard, July 29, 1969.

There is no doubt but that radiotherapy services should be centralized to a large degree. The benefits for such a scheme are well known. Cancer is not a common disease and it occurs in many forms, with the result that some types are quite rare. Thus it is only by concentrating the patients in centralized areas that it is possible to accumulate enough continuing experience in their treatment. Such a measure is also sound economically because treatment equipment and facilities are expensive to obtain and maintain. The aggregation moreover of a number of especially trained doctors in one place tends to ensure that there will be constant consultation and discussion so that the efficiency and competence of each will tend to increase, thereby providing better patient service. It is possible, when such centralization obtains, to conduct and continue clinical investigation and research, and some clinical trials become possible.

It is generally considered that a radiotherapy center should not be established for a population of less than 500,000 and most authorities would agree that the population should be in excess of one million. This ensures an adequate flow of patients for the purposes just mentioned.

The Ontario Cancer Foundation at the present time operates in its clinic system, 6 radiotherapy centers in Ontario and the Ontario

Cancer Institute, which is associated with the O.C.F., accounts for a 7th. One of the centers (Port Arthur) is very small and its only justification for existence is the geographic location. Three other centers, London, Hamilton and Ottawa, each have a large and adequate number of patients, but the numbers seen at Windsor and Kingston are borderline, when one considers the criteria mentioned above. Apart possibly from Toronto, therefore, there does not seem to me to be any justification for considering an increase in the number of radiotherapy centers in Ontario. The Ontario Cancer Institute in Toronto is a very large institution and is, I believe, saturated as far as facilities are concerned. Another center in Toronto might be considered if, for instance, a new medical school were built in the area. The existence of a new medical school alone, is, to me, sufficient justification for the establishment of a radiotherapy center either in the main hospital or some other hospital associated with the school.

Most of the OCF clinics operate so-called “peripheral clinics” at hospitals in surrounding small towns at which patients are seen for follow-up examination and some times new patients are referred to these peripheral clinics. The actual treatment however is carried out at the central clinic. In Toronto itself the same scheme applies, I believe, at the Toronto General and the Sunnybrook Hospitals where radiotherapy consultants from the Ontario Cancer Institute attend. Some types of palliative treatment are also actually given at these hospitals, under the direction of the same man.

As well as the Ontario Cancer Foundation clinics there are a number of hospitals, mostly small, scattered throughout the province in which radiation therapy is practised, usually to a small degree. In most, if not all, of these hospitals the therapy is carried out by mainly diagnostic radiologists as a part-time occupation. To my mind this is not an ideal way of treating patients with radiation therapy.

The arguments for centralization of radiotherapy apply, in a lesser degree, to chemotherapy. The Ontario Cancer Foundation, and the OCL have made considerable efforts to provide chemotherapy services in most clinics and it seems that this has been most successful because:

- a. chemotherapy is often applied to patients who are suffering from the same kinds of cancer as those referred to radiotherapy center.
- b. patients who have been treated with radiotherapy, and

subsequently suffer from recurrence or metastases, are often treated by chemotherapy and, sometimes, chemotherapy precedes radiation treatment.

- c. it is rather convenient to use the same organization and clinic facilities for chemotherapy as for radiation therapy.
- d. considerable benefit accrues to the patient from close association with both chemotherapy and radiotherapy at the same time.
- e. both chemotherapists and radiotherapists learn a great deal and therefore become more useful, when in close and amicable association.
- f. many chemotherapeutic agents are very toxic and a continuing large experience by a few individuals is valuable. Some kinds of cancer which can be treated by chemotherapy are rare and therefore should be concentrated in a few places so that adequate experience of the professional staff can be made available. Clinical trials also become feasible.
- g. if chemotherapeutic services are set up completely independently of radiotherapeutic service then some kinds of unfortunate competition can arise.
- h. experience has shown that the association of radiotherapy and chemotherapy is mutually agreeable and beneficial both to the therapeutic radiologists and internists taking part.

I do not think that it is feasible, or even desirable, to insist that all patients in whom chemotherapy might be of value should necessarily attend centralized treatment facilities. Some patients may prefer to be treated by their own physician, and in some circumstances the treatment might be just as effective as if the patient attended a central facility. I presume the patient's doctor could make use of the knowledge of his colleagues and treat the patient entirely independently. In other cases the treatment might be started centrally and then continue under the patient's private physician or internist.

I believe that the chemotherapeutic services in the OCF clinics are, in several instances, in a formative stage and encouragement in this endeavour, if your committee agrees with the general sentiments I have mentioned, might be helpful. My personal opinion is that

there is really no indication for establishing new chemotherapy centers.

These sentiments are my own personal ones and I have no authority to make any statements on behalf of the Ontario Cancer Foundation. This organization already has a free drug programme which will supply chemotherapeutic agents to needy patients on the request of their private physician. I presume you are already familiar with this scheme.

SECTION XII

Radioactive Isotope Units

Extracts from a letter from Dr. R. H. Sheppard,
Director, Department of Nuclear Medicine,
the Toronto Western Hospital, Toronto, Ontario,
to Dr. I. M. Hilliard, June 23, 1969.

Nuclear Medical services, and their place in the modern hospital are considered to be as follows:

1. Functions served

- a. Organ scanning — brain, thyroid, liver, kidney, lung, bone, spleen, placenta, pancreas, heart, cerebral spinal fluid flow, etc.

These studies as you know are particularly useful in the identification of tumors, abscesses and areas of impaired blood flow such as in the case of pulmonary embolism. Pericardial effusions, placenta previa, unrecognisable bone secondaries and thyroid bone secondaries may be defined.

b. Isotope Renography.

This technique is particularly useful in the identification of renovascular causes of hypertension, also in the detection of ureteral obstruction.

c. Thyroid function studies.

Current techniques for the measurement of serum thyroxine and T_3 resin uptake are in vitro isotopic procedures. The radioiodine uptake involves direct counting of activity accumulation in the patient's thyroid.

d. Haematologic studies.

Measurements of vitamin B_{12} absorption in pernicious anaemia, iron kinetics, red blood cell survival, platelet survival, and red blood cell and platelet disposal: all are useful forms of investigation in certain patients with haematologic disorders.

e. Body compartment studies.

Measurements of blood volume are of value particularly in shock patients. More advanced units are also utilizing exchangeable sodium and potassium studies and measurements of extracellular fluid volume.

f. GI blood loss using labelled red blood cells.

It is possible to measure quantitatively the loss of blood from the gastro-intestinal tract.

g. Radio-immunoassay.

Extremely sensitive measurements of plasma, insulin and growth hormone levels are now available. In addition, measurements of ACTH, TSH, parathyroid hormone and many other hormones present in the body are now possible using these new in vitro isotopic methods.

h. Liquid scintillation counting.

Many biological investigations involve the use of labelling with ^{14}C and 3H .

i. Radiation safety.

2. Necessary facilities

- a. Organ scanning area together with an area where patients can come to receive the radioactive material.

- b. In vitro laboratory. Here the biochemical studies are carried out.
- c. Renogram Section.
- d. Radioiodine uptake area.
- e. Blood-letting space. Here patients, coming to have blood samples taken, are looked after.
- f. Counting facility. It is best to have all counting equipment in a given section of the laboratory.
- g. Radio Pharmacy. This can be separate from the department. All isotopes are received, recorded and processed in this department. This is a "hot laboratory."
- h. Radioisotope administration area. Here treatments are administered. This is usually apart from the regular nuclear medicine laboratory.

3. **Criteria of need**

a. **Size of hospital.**

A nuclear medicine unit is necessary in all university and district hospitals. The smaller community hospital would not require such a facility. The size, of course, would vary according to the size and needs of the institution. The smaller district hospital would require adequate organ scanning facilities, possibly renography, the ability to do radioiodine uptakes, vitamin B₁₂ absorption studies and blood volumes. In vitro thyroid function tests of a simpler variety could also be carried out in such an institution though these are now available in larger commercial laboratories. A university hospital should have the full unit as described.

Research facilities necessary for the development of newer radionuclides and allowing investigations in animals need not be available in all teaching institutions yet, though, with growth of the specialty, I expect that an increasing number of departments will be provided with such developmental areas.

b. **Community served.**

A district hospital requiring a nuclear medicine laboratory

presumably would be serving a community of 50-100,000 or more. It is possible to provide simpler facilities if one is serving a smaller community yet still subserve many of the most useful basic needs of the area. In other words, as the expense of the equipment rises, the returns per dollar tend to diminish rather than increase.

4. Estimate of relative cost.

A nuclear medicine unit would have to be staffed by at least a part time physician and one or more technicians depending upon the size of the laboratory. With increased size in a larger district hospital or university hospital, one would expect to find also a radio pharmacist, a physicist and possibly associated engineers and other physicians.

In summary, any busy moderately large institution should have a nuclear medicine laboratory. The size and scope will depend upon the demands of that particular institution. A great deal of service can be provided without inordinate expense.

SECTION XIII

Coronary Care Units

Extracts from a letter from Dr. J. D. Markham
to Dr. I. M. Hilliard, August 14, 1969.

This appraisal of the above noted subject is to a large extent concerned with non-teaching hospitals in the general area of 250 to 500 bed units, referred to in some of the Commission's discussion of what might be classified as a regional/district hospital in terms of one which contains a number of highly specialized services or is planned for these services.

Some experience has been drawn from hospitals in the western provinces and the states of Minnesota and Wisconsin.

You will find enclosed a letter from Dr. Lumsden in answer to my original questions directed to the O.H.S.C. and also some local statistics from my own hospital.

Coronary Care Units appear to have evolved over the past number of years probably because of increasing consistent awareness of early catastrophes in acute myocardial/impending infarction, also because of the great sophistication of gadgetry for monitoring vital functions in these people and applying new and specialized techniques for dealing with sudden deterioration in patients' conditions.

Although opinions are diverse and the outlook often parochial, most of those interested in the problem agree that ideally this should be a unit entirely unto itself but the problem of staffing

with nurses and paramedical personnel and the physical logistics of the hospital make it seem often times necessary for this type of unit to be related at least in adjunct position to the Intensive Care area.

The establishment of such a Unit requires an enthusiasm on the part of the attending staff particularly those who are concerned with cardiac problems. It is probably why, in the many of our so-called open hospitals whose admission privileges are for everybody concerned, a committee should be struck to supervise the overall functioning of the Unit and in some way provide consultative service for all attending physicians admitting to the Unit. This of course would vary with local hospital medical staff arrangements and By-Laws.

Once such a Unit has been established, we have found that many people are taking special refresher courses of a nature to keep them continuously up-graded as to current thinking on the problems, particularly those who are charged with the overall functioning of the Unit, the ordering of equipment, the teaching of nurses and paramedical personnel.

Staffing

To say what is an ideal staffing arrangement particularly with reference to the nursing is a very thorny problem. It is this factor which makes it necessary that nurses working in the field be concerned with all types of intensive care and hence the inevitable position of the Cardiac Monitoring Unit to Intensive Care. It is most important that skilled paramedical personnel be available for the maintenance of equipment and the operation of such equipment, as it has been found that in many instances, doctors although familiar with the clinical problems are certainly not too familiar with the practical operation, repair and adjustments of some of this highly sophisticated electronic equipment.

Equipment

There is a wide variation in the degree of sophistication of monitoring devices and in the end, I suppose it depends on budgetary allowances as to how far one could go. The degree seems to be endless as one listens to the various companies promoting their product. I do not think it is necessary at this point to detail all the types of equipment as at least the basic monitoring devices are well known.

Activities of Unit Personnel Beyond the Unit Itself

Since many initial catastrophes in myocardial disease occur before the patient ever reaches the Unit, it is considered wise for the Unit personnel to have mobility to any area of the hospital to deal with in the main, cardiac arrest, ventricular fibrillation, etc. To this end we would suggest that mobile equipment in the form of what is called a "crash cart" be dispatched from the Unit in as short of period of time as possible. It is noted in the literature that there is a small portable defibrillator, an oscilloscope, that can be utilized in an ambulance. This would depend, of course, on the availability of trained personnel to operate such a complex item and this is a thought that concerns me when we are talking about the transportation of seriously ill patients.

Summary

It would appear that Cardiac Monitoring Units play a very important adjunct in the hospital, offering highly specialized services. The minimum size unit would seem to be three beds with an allowable overflow into other parts of the Intensive Care complex at peak periods. Cardiac Monitoring Unit beds should always be reserved for their specific designation as they are physically set up to function. Utilization varies a good deal and experience has been gained to indicate that utilization over 90% on the average is undesirable. Utilization is usually lower initially. The Unit should make an attempt to reserve its facilities for cases of myocardial/impending infarction even though not all types of cardiac cases are arriving at the hospital.

The length of stay in the Unit must be in the end left to the attending physician in consultation with the supervisory committee; but ground rules are possible.

In hospitals without any resident intern staff, and this is not an uncommon finding beyond the teaching areas, it becomes necessary at times to decide on the competence of our nursing personnel to carry out such procedures as electrical defibrillation. This is to some extent a medical and legal decision at the local hospital level.

In the end, any decision to establish such a highly specialized service must have the endorsement and enthusiasm of the hospital staff and some must be prepared to take time off to upgrade their thinking and knowledge of the subject and be prepared to sacrifice some time or effort in the service of the Unit itself.

Angiography

This type of procedure by its very nature seems to have become an area of interest to the Radiological Department and its medical personnel, to the extent that in many instances the Radiologist is indeed the Angiographer. It is a diagnostic tool helpful to the Cardiologist, Neurologist and Nephrologist and so becomes the discipline of many facets of the personnel involvement.

The justification for such a Unit would seem to be at a level of a regional hospital facility serving communities of 100,000 and upwards.

So much depends on the interest and skills of the local available medical and surgical personnel that no easy rule of thumb can be used to establish or decide to establish such a Unit.

One has the feeling that surgical personnel equipped to handle surgery of peripheral arteries and possibly the aortic arch and aorta should be available and interested if such a Unit is to be put into being and serve its proper purpose, that is permanent implantation of pace makers and transvenous pace makers. This subject is intimately associated with the remarks for the previous subject and it is entirely dependent in my area on the interest and competence of the medical and surgical staff. If it seemed advisable to have available to the people of Ontario such a facility, then one must either attract or re-train personnel to handle all the intricacies of the procedure and the follow-up adjustments which are often necessary.

This report may be cast in a somewhat philosophical vein; nonetheless it seems of little use to provide regional hospitals with highly sophisticated tools and gadgetry if in the end there are not enthusiastic and competent people to use them.

It may well be an indication that upgrading of existing personnel in regions throughout the province is the answer in part to the establishment of these highly specialized services. I am aware that university centres are already over burdened in their hospitals in attempting to provide these highly specialized services which I believe, by careful planning and intellectual stimulation, could be distributed among the facilities of many hospitals throughout the province. If the government in its wisdom, sees fit to place such highly specialized services throughout the province, then it must equally accept the responsibility for attracting people to these facilities and

this is particularly so in the northern and northwestern part of our province.

McKellar General Hospital

Coronary Monitoring Unit Statistics, 1968

Total Myocardial Infarctions Treated in C.M.U. 1968	92
Total Deaths of Myocardial Infarctions Treated in C.M.U.	19
Total Patients Treated in C.M.U. in 1968	191
Total Deaths of Patients Treated in C.M.U.	27
Total Deaths of C.M.U. Patients not with Myorcardial Infarcts	8

<u>Age & Sex Distribution</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
30-34 years	1	—	1
35-39	2	—	2
40-44	5	—	5
45-49	7	1	8
50-54	8	2	10
55-59	11	3	14
60-64	6	1	7
65-69	16	6	22
70-74	12	2	14
75-79	12	2	14
80-84	<u>3</u>	<u>0</u>	<u>3</u>
Totals	83*	17*	100*

Hours in C.M.U.

Total Hours spent by the 92 Myocardial Infarcts	8,631 hrs.
Average Hours per patient with Myocardial Infarct	93.8 hrs.

* Not all of these were true Myocardial Infarctions.

**Extracts from a letter from Dr. W. F. Lumsden
to Dr. J. D. Markham, April 2, 1969.**

I will list your questions concerning coronary care units in order, and then attempt to supply answers.

1. How many hospitals throughout the Province have units specifically designed for the care of acute myocardial infarction and/or coronary thrombosis?

Answer: There are 28 units in full operation and 22 additional ones in various stages of planning, planned, or approval.

2. Is this disease entity often taken care of in what might be termed "an intensive care unit, not specifically designed for heart disease alone."

Answer: Yes! We do not have complete records of all hospitals where this is done, but we think it is carried on in 46 such units.

3. How many beds are allocated in terms of the total hospital bed capacity towards the care of this particular type of disease?

Answer: We have not been assessing requirements in this manner but have allocated bed numbers on a formula depending on:

- a. The number of patients separated from the hospital with a diagnosis of myocardial infarction or coronary thrombosis annually for the past three or four years. We use the average annual figure for this period and add 30% for suspect diagnosis and increase over the next few years.
- b. Average length of stay planned for the unit.
- c. Desirable percentage occupancy for the unit – this is usually somewhere between 70 and 85%. We do not think that a utilization rate of over 85% is practical or desirable.
- d. We do not approve a unit which would have less than 3 beds. Such a unit would be very uneconomical from a staffing point of view.

- e. We recommend that the maximum size of the unit would be 8 beds. If more beds than this are required, there should be a division.
 - f. The formula actually works out to about one bed for every 60 anticipated cases of coronary thrombosis to be admitted to the unit for an average length of stay of five days.
4. Total number of admissions to either a coronary care unit and/or intensive care unit for the care of myocardial infarction in the year either 1967 or '68.

Answer: We do not actually have the answer to this question. The total number of cases of coronary thrombosis admitted to hospitals in Ontario in 1967 was 26,303, and in 1968 27,293. The diagnoses, of course, are those established at the hospital and forwarded to us on A & D card.

5. Age group and/or male or female.

Answer: Unfortunately, this information is not available in our statistics. It may be available at individual hospitals with Coronary Care Units, and we can discuss ways and means of getting at this information later if you wish.

6. Total length of stay in unit or average length of stay in unit.

Answer: Again, we do not have firm statistics on this. We think that the average is about five days, but this of course depends upon the criteria for admission to the unit, how many beds are available, and what the workload is at any particular time.

7. Are personnel permanently attached to these units or are they used in other areas of the hospital when unit not over-burdened or inactive?

Answer: The personnel are permanently attached to the unit, using the term "permanent" in the sense that they work full-time in the unit. Many hospitals have found that it is advantageous to rotate the nurses out of the unit every few months, because many nurses find it difficult to deal with this type of patient for much longer than this at any one time. In the smaller units there may be occasions when the nurses are not busy and part of the

staff may be released to perform duties in other units of the hospital. However, in most units we would not expect this to happen very often, provided the unit is not below the minimum recommended size and is properly scaled and staffed for the anticipated workload. In other words, if the staff have very much free time, our planning has probably been incorrect, or the staffing pattern is incorrect. This is one of the reasons why we do not approve of units smaller than three beds and in hospitals where a unit of this size cannot be justified we recommended that provision for this type of care be included in a part of the intensive care unit. In hospitals where even this cannot be justified, we recommend a multi-purpose room that can be used for any seriously ill patient. We recognize that neither of these two provisions are as good as a formal coronary care unit, but they are more practical in the smaller hospitals, and do seem to work reasonably well provided adequately trained staff are available.

SECTION XIV

Respiratory Failure Units, Pulmonary Function Laboratories

Extracts from a letter from Dr. E. J. M. Campbell,
Chairman, Department of Medicine, McMaster University,
Hamilton, Ontario, to Dr. I. M. Hilliard, May 5, 1969.

I do not think one can arbitrarily say that hospitals of any particular size should have either pulmonary function laboratories or respiratory failure units. I think it is more relevant to say that all hospitals have to face acute respiratory problems and the way they meet their commitment must vary depending upon their size, the number of cases and their staffing. Of these the most important question is one of staffing. I think that any community hospital of, shall we say, 400 to 500 beds or more, needs a general physician with an understanding of respiration in the same way as it needs a general physician with an understanding of cardiology. He will require to be able to do the elementary pulmonary function tests, such as spirometry, blood gases, but probably does not need a fully equipped pulmonary function laboratory doing such things as exercise test, plethysmography, lung volumes, diffusing capacity, etc. These being more economically provided by a regional laboratory, the number and size of hospitals grouped together in the region must depend upon the patient load and the distances between the hospitals, etc. Whether a hospital establishes a respiratory failure unit really depends on the way it is coping with the general question of intensive care. It so happens that the commonest problem in intensive care units is probably respiratory failure and whether a separate respiratory failure unit is set up must depend upon the pattern of work in the hospitals.

With regard to the questions that you ask.

1. I am not quite sure what is meant by "Functions served." As I have said all hospitals face the problem of managing patients with either breathlessness or respiratory failure and need some facilities for the evaluation and management of such patients. Having said that, I think one can go on to say that spirometry and PCO_2 will solve 90% of problems and the further evaluation of respiratory problems is a much lower order of complexity and urgency and can certainly be shared among hospitals.
2. The facilities planned for our hospitals follow from what has been said in that we intend to have a regional laboratory which will be responsible for the back up of the hospitals in the city. The precise balance between which tests done at all hospitals and those carried out only at the regional laboratory is yet to be defined, but I suspect this will follow from what has been said above.
3. a) Criteria of need. I suggest that you might like to read the enclosed B.M.A. report on intensive care which embodies my thinking on the question of respiratory units. (British Medical Association Planning Unit, Report of the Working Party on Intensive Care, December, 1967).

b) I think that a regional respiratory laboratory is needed for approximately one million people, but I would not be able to give a meaningful answer about a respiratory failure unit.

c) I have little doubt that all teaching centres need a respiratory unit; whether they should have more than one unit must depend on the load and geographical dispersion, but I am pretty sure that much more sharing is needed than commonly occurs. I think that a major hospital which does not have a University affiliation should have a respiratory unit if it is serving a population with sufficient respiratory disease to require evaluation which cannot be obtained by moving the patient to a teaching centre.

I apologize for not being more precise in my answers to these questions, but I am in general rather cynical having throughout the world seen units set up in the absence of adequately trained people and until the man is found the establishment of a unit is rather pointless.

**Extracts from a letter by
Dr. R. Bladek, M.A. F.R.C.P.(C), Toronto, Ontario,
to Dr. I. M. Hilliard, June 9, 1969.**

Although it is desirable to have pulmonary function laboratories closely related with respiratory failure units, pulmonary function laboratories may exist independently of the respiratory units, whereas each major respiratory failure unit should have a supporting pulmonary functions laboratory.

Pulmonary Function Laboratory

The development of pulmonary function tests and the increasing utilization of these tests in research and clinical practice by the medical profession is causing rapid changes in the assessment and the treatment of patients with respiratory disease. Pulmonary function laboratories are basically of two types:

- a. Research Laboratory
- b. Service Laboratory

a. Research Laboratory

The research laboratory requires highly trained medical and para-medical personnel. This type of laboratory should be basically limited to a university centre, preferably in a large university affiliated hospital. At present, research laboratories in the province are extremely few and carry a heavy service load. In view of the rapidly increasing mortality and morbidity from respiratory diseases, the development and support of research laboratories in this field are strongly indicated.

b. Service Laboratory

The service laboratory deals with objective measurement of broncho-pulmonary function in disease. It is predicted that the utilization of these laboratories will increase dramatically in hospitals, clinics, and doctors offices. The size of these laboratories and the choice of equipment will vary, depending on the size of the institution, the knowledge and training of the physicians, and the availability of funds. The professional interest and experience in this field is the crucial factor and will be the deciding factor in the development of these laboratories in the medical institutions of this

province. In my opinion, strong support should be given to the development of pulmonary function laboratories in all institutions, but each case should be carefully studied with special emphasis on the interest and qualifications of the medical personnel.

Pulmonary function laboratory provides important education for undergraduate and post-graduate students and practising physicians. The limited utilization of simple pulmonary function tests in the teaching of medical students and interns in the Toronto Western Hospital has resulted in dramatic improvement in their understanding of the disturbed physiology in disease. It is strongly recommended that a pulmonary function laboratory be an integral part of every teaching hospital.

Again, the size of the laboratory and the choice of the apparatus will depend chiefly on the professional experience of the supervising physician and the patients load. In medical centres other than university hospitals, the establishing of pulmonary function laboratories should be related to the size of the hospital and/or regional requirements. One form of solution of this problem would be to include the planning of the pulmonary function laboratories with the development of regional respiratory centres, for instance, the Lakehead, Sudbury, North Bay, etc.

The development of the pulmonary function laboratory in the Toronto Western Hospital has lagged approximately ten years behind similar medical and educational institutes. During the last few months a small service laboratory has been established. At present the laboratory is functioning beyond its capacity and urgent expansion in facilities, equipment, and personnel are required. The assessment of predicted needs have been submitted previously and are at present rapidly becoming inadequate. In addition to the service laboratory, this institution should have a research pulmonary laboratory.

Respiratory Failure Units

The respiratory failure units have been in the stage of evolution during the last ten years and the future of these units and their impact on hospitals is difficult to predict accurately. In my opinion, each hospital of 500 beds or more should have its own respiratory failure unit. Special consideration should be given to university teaching hospitals in which the respiratory failure unit provides training for anesthetists, chest physicians, surgeons, nurses, and other

paramedical personnel. The respiratory failure unit may be an autonomous part of an intensive care unit. In regions of Ontario not immediately served by large hospitals, respiratory failure units might be planned as a part of regional respiratory centres.

Keeping in mind the heavy demand on highly trained medical and paramedical personnel, and costs of maintenance of the respiratory failure units, special consideration should be given to methods of transportation of patients requiring care in highly developed respiratory centres. The cost of transportation should be fully subsidized by the Ontario Hospital Services Commission.

SECTION XV

Genetic Counselling, Chromosomal Analysis, and Metabolic Screening

Extracts from a Report by Dr. D. L. A. Bastedo
To the Sub-committee on Highly Specialized
Services, May 1969.

Summary: Adequate genetic counselling must be sponsored by the techniques of biochemistry, cytogenetics, immunology, etc., and, therefore, must be considered together with facilities for chromosomal analysis, metabolic screening. Existing university centres should act as a “tertiary level” for the delivery of counselling services, by developing improved technical and educational liaison with all outlying hospitals, and with the province’s physicians.

Recommendations: That the undergraduate and post-graduate education of physicians be programmed such that they can function as the primary deliverers of genetic counselling (especially the family physicians, pediatricians or obstetricians).

Extracts from a letter from Margaret W. Thompson, Ph.D.,
Associate Professor, Faculty of Medicine, University of Toronto,
Toronto, Ontario, to Dr. D. L. A. Bastedo, May 13, 1969.

Genetic counselling is a valuable service and should be available to people who want or need it. However, the best way to implement it

will take some thought. As you know, there is much disagreement about whether anyone except M.D.'s should provide it, how it should be supported, and so on. It would be logical to support it under a provincial public health programme, and there are precedents for this in the U.S.

The most serious lack in genetic counselling in Ontario at present is the lack of personnel whose primary responsibility is service (rather than research or teaching). This is true at both the professional and the technical level. If expansion of services is planned, the services provided should be insurable. (At present our hospital charges a \$10 fee for the use of its facilities for genetic counselling. This is not insurable. There is no professional fee for counsellors, who are paid as University faculty or as research fellows.)

We do not see the provision of genetic counselling services as the top priority area. We would recommend other approaches such as 1) better training of physicians in the elements of medical genetics. 2) use of geneticists as consultants rather than counsellors. 3) expansion of diagnostic centers, since counsellors rely absolutely upon accurate diagnosis, and possibly 4) training of "genetics aides" to act as field workers and thus to provide continuing liaison between professional geneticists and the families seeking their advice.

Genetic counselling centers should be associated with medical schools. There are centers in more or less advanced states of development at McMaster, Queen's, Toronto and Western. At Ottawa there is an interested pediatrician. We do not think genetic counselling (except of course by family physicians, pediatricians or obstetricians, as part of clinical counselling) should be set up outside a University medical center at this stage.

The supporting facilities for a genetic counselling service comprise all the diagnostic techniques of a first-rate hospital laboratory: biochemistry, hematology, cytogenetics, pathology, immunology, etc. Tests for "genetic markers" should be available in at least one reference laboratory in the province. This is why we envisage counselling only in major centers.

Dr. Conen will discuss with you the need for chromosomal analysis. This is an essential service in some but not all cases. The interpretation of karyotypes is a highly sophisticated activity, and except for the simplest kinds of abnormalities the interpretation should be done by an expert.

Twenty genetic counselling cases per week would be a very full load for one full-time counsellor, who would need at least one field worker or "genetics aide" to follow up families and one secretary. The laboratory work required is hard to predict: it could involve chromosome analysis or genetic markers in the blood of 25 people or more for any one case, or might be nil. No one professional would spend full time doing counselling, so a load of 20 cases per week might be distributed among a group of five or more professional people, all of whom would be expected to spend a stated proportion of time on service rather than on research, and would be reimbursed proportionately.

To sum up: We would undertake to expand genetic counselling if this is seen as a priority, but could do so only if funds are made available for service, including salaries for counsellors and for ancillary workers as well as for necessary diagnostic tests. Genetics service units should be in the five University medical centers at present, and could rely for many diagnostic tests on the appropriate hospital laboratories, but chromosome analysis and genetic marker determination should be available in the unit itself.

**Extracts from a letter from Dr. Andrew Sass-Kortsak,
Associate Professor (Paed.) and Research Associate (Pathol.)
University of Toronto, Toronto, Ontario,
to Dr. D. L. A. Bastedo, June 19, 1969.**

Harris estimates that 6% of the human population has a heritable metabolic defect. There are a large number of these conditions, each one of them rare, with incidence ranging from 1: 1000 to 1: 1,000,000 or less, but the number of these conditions is large and is increasing by new such diseases being recognized and described at the rate of 1-2 per month.

The problem area is primarily in the field of paediatrics since in the majority of such diseases the first manifestations appear in the paediatric age group, and even in those where this is not, or may not always be the case, the diagnosis should be made and treatment started early in life.

The problems should be attacked on a regional basis by a province-wide organization and hopefully then achieving links and

co-operation across Canada and even at the international level.

There are in my view four main areas which require action that could and should be integrated on a regional basis.

1. The problem of *early detection by screening* for heritable metabolic errors and chromosomal abnormalities. This in respect to some of these diseases should involve the entire population, in others segments of the population such as certain age groups (e.g. newborns, children entering school) pregnant mothers, inmates of mental and penal institutions, racial groups, family groups, etc. Once a patient is detected his whole family must be surveyed.

2. *Methods of definitive diagnosis should be made available* on a regional basis, since positive screening tests can often not be considered as more than raising the suspicion of the existence of the disease.

3. *Detection of heterozygotes* is possible in many of these conditions. This is of particular importance in parents of patients since it helps to confirm the diagnosis. In the case of conditions with high incidence in the population (e.g. cystic fibrosis, phenylketonuria) this may open the way to premarital counselling and thus to prevention.

4. *Methods of treatment* and methods to evaluate effectiveness of treatment should be made available to physicians and clinics caring for patients with inborn errors of metabolism by regional centers.

It should be noted that detection of these diseases by mass screening is but one aspect of this problem area. Early detection and case finding nevertheless is most important and has two major aims of equal importance:

- a. To make early and thus more effective treatment possible and to prevent further occurrence of the disease in the same family by counselling.
- b. To make patients' material available for study of those diseases the mechanism and nature of which is not yet known. This should lead to establishment of both new and better methods of detection, definitive diagnosis and treatment.

On the basis of the above considerations the following recommendation can be formulated at this time:

A working committee should be established and maintained to survey available resources, to determine immediate tasks and to develop long range plans for the establishment and function of a province-wide organization to provide help in the handling of problems of detection, management and prevention of genetically determined disease. The committee could function under the aegis of the Provincial Department of Health or the O.M.A.

Disciplines represented on this committee should be human genetics, paediatrics, medicine, biochemistry, epidemiology and perhaps others. Institutions and groups represented should be: The Provincial Department of Health, perhaps through the division of Maternal and Child Health, Provincial Laboratories, University Medical Schools, Mental Retardation Centers, Hospital Laboratories and perhaps others. Close liaison should be kept with such private organizations as the Cystic Fibrosis Foundation, Mental Retardation Society, Crippled Children's Society, Red Cross, etc.

A great deal of work is being carried on and much has been achieved in this area in our province. This has and is being accomplished by the Provincial Department of Health, University Medical Centers, private organizations, individuals and groups of physicians, geneticists and research workers. However a great deal more could and should be done by co-ordination of the available interests, manpower and resources and a great deal needs to be achieved by expanding efforts in a co-ordinated fashion.

SECTION XVI

Perinatal Centres

Extracts from a letter from Dr. N. T. Jaco, Chief,
Department of Paediatrics, St. Joseph's Hospital, and
Associate Professor, University of Western Ontario,
London, Ontario, to Dr. P. R. Swyer for Dr. D. L. A. Bastedo,
June 9, 1969.

On looking through the records of the Perinatal Committee of the O.M.A. a number of ideas have been discussed, but as yet no action has been taken on any of them.

In the recent report to Council, we recommended that there should be increased medical education of doctors in Perinatal Care, through the Department of Continuing Education in the Universities; training courses for Nurses in Newborn Care, and possible recognition by the College of Nursing; and that there should be a more extensive notification form to make a more detailed study of Perinatal Mortality, and possibly Morbidity, throughout the Province.

I have spent some time studying the statistics through the Vital Statistics Reports of the Province of Ontario, and also of the Dominion Bureau of Statistics in Canada. There is a wide variation in the Perinatal Mortality in different areas, and as these areas are classified by municipal areas, it is difficult to assess whether these are related to particular hospitals, or particular lack of services.

I have also been in touch with Dr. Jean-Webb, who is a member of the Child Welfare Committee, and have suggested that we should have an analysis of the Stillbirth and Neonatal Death notifications which are held by the Department of Health. I believe that there has been some classification in the Department of Health. However, I feel that this could indicate the incidence of Perinatal Mortality in regard to particular hospitals, rather than municipal areas.

The question of improving Perinatal Care throughout the Province, I am sure, is a matter of applying the principles with which we all agreed. However, it is difficult to put forward any definite scheme until we know the areas in which this care needs to be improved. I am hoping that if a statistical analysis is started through the Department of Health that this information will be forthcoming.

Although transport of infants to hospitals is a problem, I feel that this is a minor problem compared with the over-all care of the high risk pregnancy and the problem newborn. It is also difficult to conceive any over-all plan throughout the Province without knowing what trained staff is available at the Nursing level and the Paediatric level in the different areas of the Province.

I feel sure that the greatest problem is not so much setting up Intensive Care Units in large teaching centres, as making people realize the problem in the scattered peripheral hospitals, and generating an increased interest in the care of the high risk pregnancy. I feel the effort should be directed at attempting to reduce the premature birth rate, rather than concentrating on dealing with the babies after delivery.

It was my hope, through the O.M.A., that these recommendations to Council would result in a recommendation to the Minister, and that a Committee would be set up to advise the Minister in the over-all supervision of the collection of statistics, and formulate a plan for improved care throughout the Province.

Extracts from a letter from Dr. P. R. Swyer
Chief, Division Perinatology, Hospital for Sick Children,
Toronto, Ontario, to Dr. D. L. A. Bastedo,
May 30, 1969.

1. There is no question but that facilities for transportation of sick newborn infants in the Province are deficient at present though we are by no means unique in this respect.
2. Transportation, however, is but one aspect of the organization of Perinatal care in the Province which currently is not integrated or planned.
3. We lack hard data on perinatal morbidity and mortality in each of the delivering hospitals in the Province, which information is essential for the development of a regional plan of perinatal care. This would include the design and organization of transport facilities to the main referral centres in the Province.
4. In order to overcome these deficiencies it is suggested that an expert committee should be set up to advise the Minister on the development of a regional plan for the delivery of Perinatal care in the Province. This committee might consist of practising obstetricians, perinatologists, public health experts, statisticians and representatives of Government. The terms of reference of this committee should include the promulgation of a plan for a continuing survey of Provincial perinatal mortality whereby hospital perinatal committees would be charged with the responsibility for the investigation and detailed reporting to a central committee of perinatal deaths occurring in their hospital.

In this way data could be developed on which a regional plan could be based.

A major problem is the lack of a really suitable incubator for transport purposes at present. The Air-Shields costing about \$1,200 is capable of keeping the infant warm which is more than can be said for others on the market. If there is one single recommendation that could be made, it would be that some of these units should be made available at strategic locations in the Province to be used for transporting infants to referral centres. The second recommendation that I might suggest would be the necessity for educational programmes for both MD's and nursery

nurses on the problems of transporting newborn infants and thirdly, that recommendations could be drawn up concerning an equipment kit to accompany the infant should resuscitation or special care become necessary in transit.

SECTION XVII

Learning Disabilities

Report by Dr. D. L. A. Bastedo to the Sub-committees on
Highly Specialized Services, May, 1969.

A County Integration of Education and Health organizations

Basic Premises of any Learning Disability Identification Program:

- a. Objective is to reach the child's maximum, not the parents' expectation.
- b. Gains that are seen are gains in the child's strengths, not the child's weaknesses.

Operational Outline

1. Children that present as *classroom learning problems only* are handled entirely by the (Public or Separate) School Boards. Suspicion that such a condition exists may originate from parent, family physician or teacher but, in all cases, the request for investigation is made through the school principal to the respective Board's Department of Psychology and/or Special Services. If investigation at this stage suggests primary biological inadequacy, or primary socio-cultural causes, no outside consultations are required. If there are significant psychometric findings, the School Board then requests a special medical examination by the medical staff of the County Health Unit.

Such an examination includes a medical interview and history from the parents, a complete neurological examination, an audiometric examination, arrangements for a complete visual examination and, if indicated, a referral back to the family physician for special tests such as skull x-rays or electroencephelograms. The School Board then reviews the findings, and considers possible treatment and placement for the child, at a Screening Board meeting, attended by all who have seen the child.

2. Children that present with accompanying problems and behavioural changes may be investigated in the same way but, in addition, referred on to the local psychiatric clinic by the medical staff of the Health Unit, following such a decision of the Screening Board. Such accompanying problems are largely the result of prolonged disturbed family-child relationships and of excessive expectation for this child.
3. Children examined by the medical staff fall in one of three general categories:
 - a. No significant medical findings: All subsequent decisions or treatment and placement are entirely the responsibility of the School Board.
 - b. Evidences of delayed development and maturational lag (hyperactivity, mixed dominance, poor co-ordination, short attention span, etc.): Academic decisions by the Board may require accompanying medical decisions regarding drug therapy and follow-up assessment.
 - c. Evidence of organic central nervous system difficulties: Child may require sedatives, anti-convulsants, or further more specialized medical referral: all of which are reported back to the School Board to assist in their academic decisions.

**Extracts from a letter from Dr. D. L. A. Bastedo
to Dr. I. M. Hilliard, June 20, 1969.**

I think it is apparent from the replies that it is difficult to draw any final conclusion at this stage. This is particularly true when the

varying resources in each community are considered. However, a few general comments might be made.

1. The only prevention of this disability is the earlier recognition of the high risk pregnancy and the early treatment of the Neonate. From the point of view of highly specialized services, this lends further support to the recommendations for intensive perinatal transfer and care.
2. Specialized detection facilities are grossly lacking through the province. There is some difference of opinion whether such units should be educationally based, community based or be an integral part of a medical or health unit. Local conditions vary such, that a uniform policy would seem impossible at this time.
3. The Department of Health is in a position to give further specialized services in existing areas —
 - a. Existing Health Units — As per the report submission of May 23rd, 1969 — the recommendation that the M.O.H. at each Health Unit include appropriate medical personnel on the staff capable of supplying medical liaison and information with the various county school boards.
 - b. Support to existing Mental Clinics in the organization and financial endorsement for more psychiatrists with suitable pediatric orientation.

SECTION XVIII

Cerebral Palsy

Extracts from a Report by Dr. D. L. A. Bastedo to the
Sub-committee on Highly Specialized Services, May 1969.

Summary: Diagnostic centres for the identification and initial therapy of Cerebral Palsy are now being operated most effectively by the Ontario Society for Crippled Children. Mobile teams from these centres travel to outlying areas upon request of the medical profession in that area. It is felt that certain more northerly areas are not visited by such teams because of the sparse population and also because the request has not been made by the local physician. It is also felt that the facilities for “living-in” during the few days of initial assessment need to be expanded, to facilitate distant patients.

Recommendations: That the Department of Health encourage physicians and medical groups in outlying areas to invite Ontario Society for Crippled Children clinics, on a regular basis.

That treatment centres be expanded to allow several days admission during the initial period of investigation by the Ontario Society for Crippled Children.

SECTION XIX

Transportation Services

Extracts from a letter from Dr. R. A. Dolan, F.A.C.S.,
Neurological Surgery, Hamilton, Ontario,
to Dr. D. A. Rosen, May 9, 1969.

In this particular area our transportation is all carried out by ambulance and on the whole we have quite efficient services running from the towns in the areas mentioned above. In most cases patients can be brought into Hamilton in less than an hour and from there on treatment can be instituted very quickly.

I think one of the major problems in connection with ambulance service is that in the majority of cases if an injured person is picked up on the highway for example, they are always transported to the nearest hospital and seen by medical personnel there and then after diagnosis and initial treatment has been carried out they are sent on to the neurosurgical centre in a second ambulance trip. Ideally, some method should be evolved whereby seriously injured persons can be transported directly from the scene of the accident to the regional centre for treatment whether it be a purely head injury or a combined problem. Quite often the emergency services available in the smaller outlying hospitals are not completely adequate to give proper and rapid service to these patients and I am sure that the majority of the physicians in these areas would welcome some system for direct transportation to the regional centres.

This of course brings up the problem of the training of

para-medical personnel such as ambulance drivers and first-aid men who might travel with the ambulances or somehow work in conjunction with them so that the condition of the patient can be reliably recognized and initial first-aid care such as hemostasis and intravenous therapy can be begun on the spot and then rapid transit instituted. This of course might mean the alerting of the responsible medical personnel in the regional centre by radio equipped ambulances so that proper instruction could be given to those at the scene of the accident as the patient is being prepared for transportation. An exciting idea for the future in this connection would be two-way closed circuit television.

Although the transportation of the patient to the nearest hospital is always well intentioned and the medical personnel at these centres give of their best, I think this factor of intermediate delay is probably the greatest problem in transportation. Government could play an important part here, in the upgrading of ambulance services and the training of personnel and I realize that this is already being instituted.

I don't feel that air transportation such as helicopters would be frequently used in this immediate area but certainly would be of great value for outlying areas. Once again the helicopter could easily pick up a patient at the scene of an accident and transport him directly to the regional centre providing landing accommodation was available which would not be too great a problem. Again the training of personnel would be an important factor.

There are areas north of Hamilton and somewhat to the northwest in which air services might be of great value and at the moment it seems that a rather natural division could be made of geographic areas in logical relationship to London, Hamilton and Toronto for the purposes of air transport. The great northwestern part of Ontario, that is north of Lake Superior while sparsely populated might well be served by a neurosurgical centre or traumatic emergency centre at Fort William and Port Arthur. Sudbury might also receive some consideration for the development of an adequate neurosurgical centre. The more easterly parts of the province would of course be adequately served by Ottawa, Kingston and Montreal.

SECTION XX

Services in Each Province

**Extracts from a report by Dr. B. L. P. Brosseau
to Sub-committee on Highly Specialized Services,
August, 1969.**

Following a request for information, sent to all Provincial Hospital Associations on March 21st, answers have been received from all provinces and the Northwest Territories. The latter do not provide any of the services listed in the original inquiry. Ontario did not submit a report, but referred the matter to the O.H.S.C. who it was thought were in better position to supply the required information and I notice that information has been supplied to the Committee by Dr. Lumsden. I am not aware whether further details have been submitted by the O.H.S.C. on the other areas outlined in my letter of March 21st.

Authorization for development of highly specialized services is dependant in all provinces on the approval of the authorities of the Provincial Hospital plan. But the basis or the criteria for allocating these services are not always clear. Need and demand are often confused and in these provinces where there is no regional plan or organization there appears to be some overlapping of services areas and at times unnecessary duplication.

The more highly specialized services, and particularly those which contain a research element, are allocated as a rule to University affiliated teaching hospitals or to the Faculty of Medicine

research facilities. Although not much has been said about Health Science Centres and University Hospitals proper, it is felt that they will be playing an increasingly important role in the provision of the more highly specialized in services and will be responsible for the associated research.

In these few provinces where there is no Faculty of Medicine (N.B. and P.E.I.), Highly Specialized Services are either provided on a minimal scale or concentrated in a base hospital with some allocation to regional centers.

The Northwest Territories do not provide highly specialized services. They rely mainly on the facilities of the Provinces to the South, particularly Alberta.

There is an increasing awareness by governments of hospital costs *and* most provincial authorities are now looking much closer at hospital services areas, needs and allocation of services on the basis need in relation to population served. The educational aspect, important as it is, remains subordinate to patient need and quality of care.

*Report of Sub-committee
on Laboratory Systems*

REPORT

Regional Laboratory Services *October, 1968*

General

At the time of the presentation of this report, the Sub-committee functioned under the Committee on Regional Organization of Health Services. In its continuing role, it functions under the Committee on Health Care Delivery Systems, with new terms of reference.

Terms of Reference

For the preparation of this report the Sub-committee was given terms of reference as follows:

*To study the advisability, feasibility and pattern for development of a regional system for providing laboratory services within a regional system for delivery of health care services, and to recommend a pattern for development of a plan which would be sufficient to allow further steps to be taken.**

Regional Laboratory Services

The concept has been developed that Regional Laboratory Services,

* The terms of reference of the Sub-committee were taken to apply primarily to diagnostic and other laboratory services related to patient investigation and care. It is recognized that other laboratories exist, supported by different levels and departments of government, which might integrate with some aspects of a regional programme, but which will require further studies.

within the context of Regional organization of health services, is desirable, feasible, and economically sound in terms of the unit cost. An integrated laboratory service would make the best use of available medical and technical skills, as well as the skills and expertise of highly trained laboratory scientists. Thus, there is the need to develop integrated Regional Laboratory Programmes which could, but not necessarily would, involve centralization. Any decision regarding centralization should be determined by the specific needs and considerations within each region. For certain procedures in some regions, integrated de-centralization may best serve the purpose of service, education, local involvement, and research and development.

It must be emphasized that the intent of the proposed Regional organization is to increase the efficiency of existing laboratory services and to provide an orderly framework for the expansion of these services, so that patient and clinician alike may receive the maximum benefits from the available resources. A greater range of services will be made available to a larger proportion of our population.* These high quality services will be expensive, but the overall cost should not be the determining factor. The overriding benefit would be high quality medical care.

The integrated regional programme should subserve the following functions:

- a. The delivery of high level expert professional service. This would involve primarily the skills and background of the laboratory physicians and scientists.
- b. Delivery of accurate analytic data backed by the highest level of quality control programmes in all phases.
- c. Programme co-ordination. This would be accomplished by appropriate communications and record systems to provide a

* Under the existing system, a great many laboratory tests are not readily available to clinicians in outlying areas at a time when they are meaningful. Given a regional system with the physical resources and an appropriate communication system, these tests, with the proper consultative advice, could be readily available in all areas. For example, a reference laboratory in one centre could perform all placental estrogen studies for the entire region or even more than one region. Other examples could include PBI determinations, other endocrine assays, porphyrions, etc. Special procedures can now be provided through commercial laboratories mostly in the U.S.A., but such services are slow, costly and of unknown quality.

rapid and reliable transmission of specimens, reports, and interpretations. Into this should be built a system of storage and retrieval of data for assessment of efficiency, for statistical analysis and research. The stored data could become part of a total information file on each patient.

- d. Enhancement of the training of all categories of laboratory workers including laboratory physicians, scientists, and technologists.
- e. Participation in the educational processes of the medical student as well as the graduate physician.
- f. Entrenchment within this programme of the research and development that is so necessary in the improvement of delivery of laboratory services.

Functional Regional Laboratory Organization

The core of each region could be a grouping of laboratories, with integrated and correlated services, located at the regional centre (see Chart I). This may or may not be associated with a university Health Sciences Centre. The core or integrated complex would include the existing hospital laboratories as well as others which would contribute to the integrated health programme.* Allowance must be made for flexibility, easy changeability, expansion, and addition of new facilities as the services and developing technology demand. There could be, as well, a geographically centered laboratory if the circumstances dictate.

The organizational nature of the regional core or integrated complex should be such as to handle at all levels community needs of total health services, including reference centres. At the same time it must also serve local community needs.

The detailed mechanics should first be worked out on the recommendation of the professional people responsible for these services in the proposed integrated laboratories. In addition the users

* The first footnote relates to this in general terms. The term "other laboratories" includes existing public health laboratories, university laboratories, the Attorney-General's forensic laboratory and private laboratories, but does not include veterinary medicine laboratories and laboratories operating under government departments other than the Department of Health.

as well as the peripheral providers should be involved in the development of the recommendations. In working out the mechanics and organization of such an integrated laboratory complex, overriding consideration must be given to the needs of service, teaching, research and development, and quality control.

In view of the complexity and continuing rapid development in the field of medical technology, including data handling, systems design and operation analysis, biometrics and statistics, it is imperative that the educational aspects of the programme be closely integrated with the overall regional health programme.*

The resources of the central core or integrated laboratory complex should be available to the districts and communities of the functional region in such a way as to utilize facilities, equipment, and personnel to the best advantage. At the same time, the districts and communities should develop programmes that would supply immediate and emergency laboratory services, as well as develop such programmes as are justified by local conditions.

It is hoped, too, that the functional regions would be developed across the province and that the various regional programmes could be integrated into a comprehensive provincial programme. In other words, there should be functioning inter-regional liaison.

Once established, there should be an ongoing review of the regional laboratory system in order to determine its effectiveness and relevance to patient care in terms of delivery of laboratory services. This review should also determine the changing needs in each region and in the province.

* Education is here used in a wide sense to apply not only to training of technologists, but also of physicians, clinical scientists, administrators, nurses and the many other types of support personnel who are involved in the use, delivery and implementation of laboratory services. In the education and training of such personnel it is obvious that no single route of training is presently available and that the resources of hospitals, universities, community colleges and other institutions must work out a co-operative plan. This is a complicated matter which deserves study by the Committee on Education of the Health Disciplines.

CHART I

